

APPENDIX 2.3-6.1

OVERBURDEN ANALYSIS DATA FOR SHMW-04D

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR   | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|-------|---------------------------|------------------|------------------|------------------|-----------------|
| 4                         | 2539.8                         | 5                            | 2538.8                            | 0.96            | 0.73          | 2.64              | 8.2       | 4.25           | 3.17  | 49.4                      | 33.8             | 41.2             | 25               | Loam            |
| 5                         | 2538.8                         | 10                           | 2533.8                            | 21.7            | 12.7          | 86.7              | 4.4       | 91.9           | 12.5  | 72.1                      | 56.2             | 21.3             | 22.5             | Sandy Clay Loam |
| 12                        | 2531.8                         | 14                           | 2529.8                            | 21.6            | 9.38          | 57.6              | 4.1       | 58.6           | 9.32  | 66.5                      | 7.5              | 27.5             | 65               | Clay            |
| 16                        | 2527.8                         | 18                           | 2525.8                            | 6.88            | 4.09          | 17.2              | 7.7       | 26             | 7.49  | 70.8                      | 5                | 60               | 35               | Silty Clay Loam |
| 21                        | 2522.8                         | 23                           | 2520.8                            | 3.34            | 3.42          | 8.96              | 8.4       | 24.1           | 9.73  | 86.8                      | 6.2              | 58.8             | 35               | Silty Clay Loam |
| 27                        | 2516.8                         | 30                           | 2513.8                            | 3.20            | 2.7           | 6.63              | 8.3       | 18.5           | 8.34  | 79                        | 8.8              | 58.7             | 32.5             | Silty Clay Loam |
| 30                        | 2513.8                         | 32                           | 2511.8                            | 5.57            | 3.63          | 10.7              | 7.2       | 23.6           | 8.27  | 80.1                      | 8.8              | 48.7             | 42.5             | Silty Clay      |
| 37                        | 2506.8                         | 38                           | 2505.8                            | 2.59            | 2.57          | 4.25              | 8.5       | 19.6           | 10.6  | 89.4                      | 3.8              | 55               | 41.2             | Silty Clay      |
| 39                        | 2504.8                         | 42                           | 2501.8                            | 6.12            | 4.58          | 9.63              | 8.3       | 35.9           | 12.8  | 42.3                      | 53.8             | 27.4             | 18.8             | Sandy Loam      |
| 46                        | 2497.8                         | 49                           | 2494.8                            | 0.87            | 1.7           | 0.78              | 8.6       | 14.7           | 16.2  | 105                       | 8.8              | 63.7             | 27.5             | Silty Clay Loam |
| 54                        | 2489.8                         | 54                           | 2489.8                            | 0.87            | 2.41          | 2.83              | 8.4       | 22.7           | 16.6  | 141                       | 6.2              | 43.8             | 50               | Silty Clay      |
| 56                        | 2487.8                         | 56                           | 2487.8                            | 0.40            | 1.38          | 0.38              | 8.9       | 12.5           | 20.0  | 114                       | 16.3             | 61.2             | 22.5             | Silt Loam       |
| 61                        | 2482.8                         | 61                           | 2482.8                            | 0.91            | 2.45          | 0.66              | 9.5       | 26.0           | 29.4  | 68.6                      | 58.8             | 23.7             | 17.5             | Sandy Loam      |
| 66                        | 2477.8                         | 66                           | 2477.8                            | 0.55            | 2.14          | 0.45              | 9.5       | 22.7           | 32.1  | 55.6                      | 71.2             | 16.3             | 12.5             | Sandy Loam      |
| 87                        | 2456.8                         | 87                           | 2456.8                            | 0.12            | 1.03          | 0.10              | 9.0       | 9.25           | 27.6  | 161                       | 6.2              | 38.8             | 55               | Clay            |
| 92                        | 2451.8                         | 92                           | 2451.8                            | 0.68            | 1.16          | 0.55              | 9.4       | 12.6           | 16.0  | 110                       | 5                | 63.8             | 31.2             | Silty Clay Loam |
| 97                        | 2446.8                         | 97                           | 2446.8                            | 0.36            | 0.81          | 0.24              | 9.4       | 8.55           | 15.6  | 43.5                      | 71.2             | 17.6             | 11.2             | Sandy Loam      |
| 102                       | 2441.8                         | 102                          | 2441.8                            | 0.13            | 1.43          | 0.26              | 9.2       | 13.8           | 31.2  | 149                       | 3.8              | 18.7             | 77.5             | Clay            |
| 104                       | 2439.8                         | 105                          | 2438.8                            | 0.55            | 1.02          | 0.39              | 9.7       | 11.6           | 16.90 | 101                       | 21.2             | 56.3             | 22.5             | Silt Loam       |
| 109                       | 2434.8                         | 109                          | 2434.8                            | 0.18            | 1.11          | 0.14              | 9.5       | 10.8           | 27.0  | 129                       | 8.8              | 57.4             | 33.8             | Silty Clay Loam |
| 114                       | 2429.8                         | 114                          | 2429.8                            | 0.24            | 1.61          | 0.23              | 9.3       | 15.5           | 32.0  | 149                       | 7.5              | 52.5             | 40               | Silty Clay      |
| 119                       | 2424.8                         | 119                          | 2424.8                            | 0.57            | 2.18          | 1.84              | 8.9       | 22.8           | 20.8  | 103                       | 6.3              | 48.7             | 45               | Silty Clay      |
| 124                       | 2419.8                         | 124                          | 2419.8                            | 0.28            | 0.90          | 0.34              | 9.7       | 8.9            | 16.0  | 84.5                      | 57.5             | 23.7             | 18.8             | Sandy Loam      |
| 129                       | 2414.8                         | 129                          | 2414.8                            | 0.11            | 1.2           | 0.09              | 9.4       | 11.8           | 37.4  | 142                       | 10               | 53.7             | 36.3             | Silty Clay Loam |
| 134                       | 2409.8                         | 134                          | 2409.8                            | 0.12            | 1.11          | <0.08             | 9.4       | 10.4           | 37.3  | 156                       | 3.8              | 46.2             | 50               | Silty Clay      |
| 139                       | 2404.8                         | 139                          | 2404.8                            | 0.09            | 1.11          | 0.15              | 9.6       | 10.7           | 31.3  | 144                       | 15               | 50               | 35               | Silty Clay Loam |
| 144                       | 2399.8                         | 144                          | 2399.8                            | 0.35            | 1.33          | 0.22              | 9.7       | 12.9           | 24.2  | 71.4                      | 65               | 18.7             | 16.3             | Sandy Loam      |
| 148                       | 2395.8                         | 153                          | 2390.8                            | 0.15            | 1.23          | 0.16              | 9.3       | 12.0           | 30.4  | 59.7                      | 71.3             | 14.9             | 13.8             | Sandy Loam      |
| 153                       | 2390.8                         | 158                          | 2385.8                            | 0.58            | 0.83          | 0.41              | 9.4       | 8.88           | 12.6  | 46.7                      | 75               | 12.5             | 12.5             | Sandy Loam      |
| 158                       | 2385.8                         | 163                          | 2380.8                            | 0.34            | 0.90          | 0.20              | 9.2       | 9.09           | 17.5  | 46.6                      | 75               | 15               | 10               | Sandy Loam      |
| 163                       | 2380.8                         | 168                          | 2375.8                            | 0.13            | 1.11          | <0.08             | 9.4       | 10.3           | 32.4  | 47.5                      | 76.3             | 13.7             | 10               | Sandy Loam      |
| 168                       | 2375.8                         | 173                          | 2370.8                            | 0.43            | 0.75          | 0.27              | 9.5       | 7.47           | 12.7  | 45.7                      | 77.5             | 12.5             | 10               | Sandy Loam      |
| 173                       | 2370.8                         | 180                          | 2363.8                            | 0.26            | 1.47          | 0.30              | 9.5       | 13.6           | 25.8  | 48.6                      | 77.5             | 11.2             | 11.3             | Sandy Loam      |
| 180                       | 2363.8                         | 185                          | 2358.8                            | 0.19            | 1.18          | <0.08             | 9.8       | 10.7           | 29.2  | 62.3                      | 73.8             | 14.9             | 11.3             | Sandy Loam      |
| 185                       | 2358.8                         | 190                          | 2353.8                            | 0.34            | 0.75          | 0.28              | 9.7       | 8.79           | 15.8  | 79.0                      | 72.5             | 15               | 12.5             | Sandy Loam      |
| 190                       | 2353.8                         | 195                          | 2348.8                            | 0.08            | 1.37          | <0.08             | 9.5       | 12.8           | 48.0  | 158                       | 6.3              | 31.2             | 62.5             | Clay            |
| 195                       | 2348.8                         | 200                          | 2343.8                            | 0.23            | 1.01          | 0.16              | 9.5       | 9.64           | 21.8  | 124                       | 6.3              | 48.7             | 45               | Silty Clay      |
| 200                       | 2343.8                         | 204                          | 2339.8                            | 0.29            | 0.78          | 0.35              | 9.4       | 7.65           | 13.5  | 128                       | 10               | 32.5             | 57.5             | Clay            |
| 222                       | 2321.8                         | 227                          | 2316.8                            | 0.18            | 0.84          | 0.31              | 9.7       | 7.83           | 15.9  | 138                       | 16.3             | 31.2             | 52.5             | Clay            |
| 227                       | 2316.8                         | 232                          | 2311.8                            | 0.14            | 1.07          | 0.26              | 9.3       | 10.3           | 23.1  | 140                       | 8.8              | 33.7             | 57.5             | Clay            |
| 232                       | 2311.8                         | 235                          | 2308.8                            | 0.31            | 0.52          | 0.48              | 9.7       | 5.37           | 8.52  | 192                       | 11.3             | 57.4             | 31.3             | Silty Clay Loam |
| 235                       | 2308.8                         | 240                          | 2303.8                            | 1.5             | 0.63          | 0.65              | 9.4       | 6.05           | 5.83  | 95.3                      | 0                | 75               | 25               | Silt Loam       |
| 240                       | 2303.8                         | 243                          | 2300.8                            | 0.44            | 0.55          | 0.40              | 9.5       | 4.98           | 7.68  | 181                       | 10               | 52.5             | 37.5             | Silty Clay Loam |
| 243                       | 2300.8                         | 250                          | 2293.8                            | 0.36            | 0.63          | 0.38              | 9.6       | 6.40           | 10.6  | 185                       | 12.5             | 56.2             | 31.3             | Silty Clay Loam |
| 251                       | 2292.8                         | 255                          | 2288.8                            | 0.15            | 0.77          | <0.08             | 9.8       | 8.03           | 25.3  | 182                       | 25               | 46.2             | 28.8             | Clay Loam       |

Statistical Summary

|         |      |      |       |     |      |      |      |      |      |      |
|---------|------|------|-------|-----|------|------|------|------|------|------|
| Min     | 0.08 | 0.52 | <0.08 | 4.1 | 4.25 | 3.17 | 42.3 | 0    | 11.2 | 10   |
| Average | 1.90 | 1.92 | 4.86  | 9.0 | 16.0 | 19.7 | 103  | 30   | 38   | 32   |
| Max     | 21.7 | 12.7 | 86.7  | 9.8 | 91.9 | 48.0 | 192  | 77.5 | 75   | 77.5 |
| Number  | 45   | 45   | 45    | 45  | 45   | 45   | 45   | 45   | 45   | 45   |

Depth to Coal: 69'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.40 | 0.73 | 0.38 | 4.1 | 4.25 | 3.17 | 42.3 | 3.8  | 16.3 | 12.5 |
| Average | 5.40 | 3.85 | 15.0 | 7.9 | 28.6 | 14.0 | 80.0 | 25   | 43   | 32   |
| Max     | 21.7 | 12.7 | 86.7 | 9.5 | 91.9 | 32.1 | 141  | 71.2 | 63.7 | 65   |
| Number  | 14   | 14   | 14   | 14  | 14   | 14   | 14   | 14   | 14   | 14   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- In calculating arithmetic mean < 0.08 is assumed to be 0.04
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.2

OVERBURDEN ANALYSIS DATA FOR SHMW-05D

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 5                         | 2633.6                         | 10                           | 2628.6                            | 11.3            | 5.87          | 19.7              | 8.1       | 42             | 10.7 | 133                       | 2.5              | 27.5             | 70               | Clay            |
| 12                        | 2626.6                         | 16                           | 2622.6                            | 12.8            | 5.71          | 17                | 7.7       | 41.6           | 10.8 | 140                       | 3.8              | 37.4             | 58.8             | Clay            |
| 17                        | 2621.6                         | 20                           | 2618.6                            | 12.7            | 5.64          | 16.4              | 7.4       | 41             | 10.8 | 127                       | 6.2              | 42.6             | 51.2             | Silty Clay      |
| 22                        | 2616.6                         | 26                           | 2612.6                            | 1.74            | 2.72          | 2.59              | 8.4       | 23.1           | 15.7 | 151                       | 6.2              | 56.3             | 37.5             | Silty Clay Loam |
| 27                        | 2611.6                         | 32                           | 2606.6                            | 1.07            | 1.93          | 1.30              | 8.6       | 15.9           | 14.6 | 145                       | 5                | 48.8             | 46.2             | Silty Clay      |
| 32                        | 2606.6                         | 35                           | 2603.6                            | 0.83            | 1.59          | 0.83              | 8.9       | 13.3           | 14.6 | 126                       | 8.8              | 55               | 36.2             | Silty Clay Loam |
| 35                        | 2603.6                         | 37                           | 2601.6                            | 5.77            | 3.26          | 7.11              | 8.0       | 24.2           | 9.53 | 123                       | 11.2             | 46.3             | 42.5             | Silty Clay      |
| 43                        | 2595.6                         | 48                           | 2590.6                            | 0.57            | 1.50          | 0.52              | 9.1       | 12.2           | 16.6 | 151                       | 8.8              | 35               | 56.2             | Clay            |
| 50                        | 2588.6                         | 55                           | 2583.6                            | 0.21            | 0.93          | 0.30              | 9.8       | 8.71           | 17.3 | 236                       | 13.8             | 33.7             | 52.5             | Clay            |
| 57                        | 2581.6                         | 63                           | 2575.6                            | 0.47            | 1.40          | 0.37              | 9.0       | 12.8           | 19.7 | 120                       | 20               | 53.8             | 26.2             | Silt Loam       |
| 65                        | 2573.6                         | 68                           | 2570.6                            | 0.45            | 0.68          | 0.26              | 9.3       | 6.21           | 10.4 | 101                       | 8.8              | 65               | 26.2             | Silt Loam       |
| 69                        | 2569.6                         | 74                           | 2564.6                            | 0.35            | 0.81          | 0.29              | 9.2       | 7.52           | 13.3 | 70                        | 13.8             | 63.7             | 22.5             | Silt Loam       |
| 75                        | 2563.6                         | 80                           | 2558.6                            | 0.09            | 0.78          | 0.14              | 9.4       | 7.38           | 21.8 | 30.9                      | 41.2             | 48.8             | 10               | Loam            |
| 80                        | 2558.6                         | 85                           | 2553.6                            | 0.35            | 0.79          | 0.38              | 9.5       | 8.01           | 13.3 | 31.7                      | 56.2             | 32.6             | 11.2             | Sandy Loam      |
| 85                        | 2553.6                         | 90                           | 2548.6                            | 0.36            | 0.77          | 0.22              | 9.5       | 8.55           | 15.8 | 32.6                      | 71.2             | 20               | 8.8              | Sandy Loam      |
| 90                        | 2548.6                         | 95                           | 2543.6                            | 0.66            | 0.91          | 0.41              | 9.6       | 8.68           | 11.9 | 52.5                      | 78.8             | 13.7             | 7.5              | Loamy Sand      |
| 95                        | 2543.6                         | 100                          | 2538.6                            | 0.86            | 1.23          | 0.82              | 9.3       | 11.0           | 12.0 | 33.5                      | 76.2             | 17.6             | 6.2              | Loamy Sand      |
| 100                       | 2538.6                         | 105                          | 2533.6                            | 0.51            | 0.48          | 0.31              | 9.0       | 3.83           | 6.0  | 29.6                      | 56.2             | 28.8             | 15               | Sandy Loam      |
| 105                       | 2533.6                         | 110                          | 2528.6                            | 0.59            | 0.62          | 0.31              | 9.0       | 5.82           | 8.66 | 27.7                      | 17.5             | 61.2             | 21.3             | Silt Loam       |
| 110                       | 2528.6                         | 115                          | 2523.6                            | 0.43            | 0.72          | 0.40              | 8.9       | 6.88           | 10.6 | 29.8                      | 45               | 35               | 20               | Loam            |
| 115                       | 2523.6                         | 120                          | 2518.6                            | 0.77            | 1.34          | 0.48              | 9.3       | 12.7           | 16.1 | 41.5                      | 61.3             | 28.7             | 10               | Sandy Loam      |
| 120                       | 2518.6                         | 124                          | 2514.6                            | 0.84            | 1.79          | 0.52              | 9.4       | 17.6           | 21.3 | 47                        | 63.8             | 21.2             | 15               | Sandy Loam      |
| 124                       | 2514.6                         | 129                          | 2509.6                            | 0.37            | 0.76          | 0.25              | 9.2       | 7.59           | 13.7 | 130                       | 0                | 58.7             | 41.3             | Silty Clay      |
| 129                       | 2509.6                         | 133                          | 2505.6                            | 0.6             | 1.07          | 0.37              | 9.3       | 10.4           | 14.9 | 137                       | 1.3              | 61.2             | 37.5             | Silty Clay Loam |
| 133                       | 2505.6                         | 136                          | 2502.6                            | 0.44            | 1.16          | 0.30              | 9.4       | 11.5           | 19.0 | 109                       | 27.5             | 51.2             | 21.3             | Silt Loam       |
| 136                       | 2502.6                         | 141                          | 2497.6                            | 0.34            | 1.01          | 0.26              | 9.5       | 9.58           | 17.5 | 79.8                      | 61.3             | 21.2             | 17.5             | Sandy Loam      |
| 141                       | 2497.6                         | 146                          | 2492.6                            | 0.36            | 1.42          | 0.26              | 9.5       | 13.8           | 24.9 | 76.2                      | 70               | 17.5             | 12.5             | Sandy Loam      |
| 146                       | 2492.6                         | 151                          | 2487.6                            | 0.32            | 1.26          | 0.23              | 9.2       | 11.9           | 22.6 | 58.6                      | 72.5             | 17.5             | 10               | Sandy Loam      |
| 175                       | 2463.6                         | 177.5                        | 2461.1                            | 0.49            | 1.16          | 0.29              | 9.4       | 11.4           | 18.2 | 180                       | 2.5              | 55               | 42.5             | Silty Clay      |
| 184                       | 2454.6                         | 188                          | 2450.6                            | 0.22            | 0.99          | 0.15              | 9.3       | 9.4            | 21.8 | 84.2                      | 60               | 21.2             | 18.8             | Sandy Loam      |
| 193                       | 2445.6                         | 198                          | 2440.6                            | 0.55            | 1.04          | 0.29              | 9.4       | 9.97           | 15.4 | 70.8                      | 70               | 13.7             | 16.3             | Sandy Loam      |
| 198                       | 2440.6                         | 203                          | 2435.6                            | 0.61            | 1.31          | 0.35              | 9.5       | 13.2           | 19.1 | 66.6                      | 67.5             | 25               | 7.5              | Sandy Loam      |
| 205                       | 2433.6                         | 210                          | 2428.6                            | 0.37            | 0.71          | 0.22              | 9.3       | 6.42           | 11.8 | 64.2                      | 70               | 18.7             | 11.3             | Sandy Loam      |
| 210                       | 2428.6                         | 215                          | 2423.6                            | 0.25            | 1.77          | 0.19              | 9.4       | 18.3           | 39.2 | 63.2                      | 67.5             | 15               | 17.5             | Sandy Loam      |
| 215                       | 2423.6                         | 220                          | 2418.6                            | 0.39            | 1.16          | 0.25              | 9.3       | 11.3           | 20.1 | 65.8                      | 71.3             | 17.4             | 11.3             | Sandy Loam      |
| 220                       | 2418.6                         | 225                          | 2413.6                            | 0.38            | 1.06          | 0.24              | 9.4       | 10.1           | 18.3 | 77                        | 62.5             | 18.7             | 18.8             | Sandy Loam      |
| 225                       | 2413.6                         | 230                          | 2408.6                            | 0.35            | 1.33          | 0.25              | 9.4       | 13.1           | 24   | 69.8                      | 67.5             | 21.2             | 11.3             | Sandy Loam      |
| 230                       | 2408.6                         | 235                          | 2403.6                            | 0.34            | 1.27          | 0.20              | 9.4       | 12.5           | 24.2 | 73.6                      | 72.5             | 16.2             | 11.3             | Sandy Loam      |
| 235                       | 2403.6                         | 238                          | 2400.6                            | 0.18            | 0.94          | 0.12              | 9.3       | 8.55           | 22   | 50.6                      | 80               | 6.2              | 13.8             | Sandy Loam      |
| 239.5                     | 2399.1                         | 242                          | 2396.6                            | 0.29            | 1.04          | 0.22              | 9.1       | 11.1           | 22.1 | 170                       | 6.3              | 48.7             | 45               | Silty Clay      |
| 242                       | 2396.6                         | 244                          | 2394.6                            | 0.22            | 1.03          | 0.28              | 9.1       | 10.6           | 21.4 | 159                       | 5                | 37.5             | 57.5             | Clay            |
| 244                       | 2394.6                         | 250                          | 2388.6                            | 0.29            | 0.97          | 0.23              | 9.1       | 9.57           | 18.8 | 129                       | 1.3              | 58.7             | 40               | Silty Clay      |

Statistical Summary

|         |      |      |      |     |      |      |      |    |     |     |
|---------|------|------|------|-----|------|------|------|----|-----|-----|
| Min     | 0.09 | 0.48 | 0.12 | 7.4 | 3.83 | 6.0  | 27.7 | 0  | 6.2 | 6.2 |
| Average | 1.45 | 1.52 | 1.80 | 9.1 | 13.3 | 16.9 | 92.7 | 38 | 35  | 27  |
| Max     | 12.8 | 5.87 | 19.7 | 9.8 | 42   | 39.2 | 236  | 80 | 65  | 70  |
| Number  | 42   | 42   | 42   | 42  | 42   | 42   | 42   | 42 | 42  | 42  |

Depth to Coal: 152.5'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |     |
|---------|------|------|------|-----|------|------|------|------|------|-----|
| Min     | 0.09 | 0.48 | 0.14 | 7.4 | 3.83 | 6.0  | 27.7 | 0    | 13.7 | 6.2 |
| Average | 2.01 | 1.72 | 2.58 | 9.0 | 14.4 | 14.8 | 91.8 | 32   | 39   | 28  |
| Max     | 12.8 | 5.87 | 19.7 | 9.8 | 42   | 24.9 | 236  | 78.8 | 65   | 70  |
| Number  | 28   | 28   | 28   | 28  | 28   | 28   | 28   | 28   | 28   | 28  |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.3

OVERBURDEN ANALYSIS DATA FOR SHMW-06D

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 1.5                       | 2548.4                         | 5                            | 2544.9                            | 6.82            | 2.46          | 7.38              | 7.7       | 12.8           | 4.8  | 65.4                      | 20               | 26.2             | 53.8             | Clay            |
| 5                         | 2544.9                         | 8                            | 2541.9                            | 25.1            | 4.92          | 26.2              | 7.7       | 19.9           | 3.93 | 66.4                      | 12.5             | 25               | 62.5             | Clay            |
| 11.5                      | 2538.4                         | 15                           | 2534.9                            | 5.14            | 2.12          | 5.2               | 8.1       | 10.4           | 4.57 | 44                        | 35               | 46.2             | 18.8             | Loam            |
| 15                        | 2534.9                         | 20                           | 2529.9                            | 4.5             | 1.28          | 3.28              | 8.0       | 4.7            | 2.38 | 37.4                      | 47.5             | 41.2             | 11.3             | Loam            |
| 21.5                      | 2528.4                         | 25                           | 2524.9                            | 8.03            | 1.63          | 4.76              | 7.9       | 5.33           | 2.11 | 42.3                      | 26.3             | 61.2             | 12.5             | Silt Loam       |
| 25                        | 2524.9                         | 30                           | 2519.9                            | 7.34            | 1.59          | 4.43              | 7.9       | 5.42           | 2.23 | 40.8                      | 31.3             | 57.4             | 11.3             | Silt Loam       |
| 30                        | 2519.9                         | 35                           | 2514.9                            | 9.52            | 1.91          | 5.56              | 7.9       | 6.54           | 2.38 | 39.4                      | 48.8             | 41.2             | 10               | Loam            |
| 35                        | 2514.9                         | 37                           | 2512.9                            | 10.1            | 2.29          | 6.44              | 8.0       | 8.08           | 2.81 | 36.1                      | 36.3             | 41.2             | 22.5             | Loam            |
| 37                        | 2512.9                         | 41                           | 2508.9                            | 10.3            | 2.24          | 6.64              | 7.9       | 8.53           | 2.93 | 33.4                      | 61.3             | 32.4             | 6.3              | Sandy Loam      |
| 41                        | 2508.9                         | 45                           | 2504.9                            | 7.94            | 2.36          | 6.48              | 8.1       | 11.3           | 4.2  | 32.7                      | 53.8             | 34.9             | 11.3             | Sandy Loam      |
| 46.5                      | 2503.4                         | 51.5                         | 2498.4                            | 21.8            | 6.57          | 38.7              | 7.5       | 33.9           | 6.17 | 52.2                      | 42.5             | 37.5             | 20               | Loam            |
| 69.5                      | 2480.4                         | 72.5                         | 2477.4                            | 0.64            | 1.25          | 0.48              | 9.0       | 11.8           | 15.7 | 150                       | 20               | 45               | 35               | Silty Clay Loam |
| 72.5                      | 2477.4                         | 77.5                         | 2472.4                            | 0.52            | 0.95          | 0.4               | 9.2       | 8.6            | 12.7 | 164                       | 30               | 46.2             | 23.8             | Loam            |
| 78                        | 2471.9                         | 83                           | 2466.9                            | 0.64            | 1.63          | 0.4               | 9.3       | 16.8           | 23.3 | 123                       | 23.8             | 59.9             | 16.3             | Silt Loam       |
| 83                        | 2466.9                         | 88                           | 2461.9                            | 0.43            | 1.62          | 0.34              | 9.2       | 16             | 25.8 | 73.2                      | 58.8             | 29.9             | 11.3             | Sandy Loam      |
| 88                        | 2461.9                         | 93                           | 2456.9                            | 0.84            | 3.46          | 0.96              | 7.9       | 39.7           | 41.8 | 98                        | 71.3             | 16.2             | 12.5             | Sandy Loam      |
| 93                        | 2456.9                         | 97                           | 2452.9                            | 0.51            | 1.97          | 0.39              | 9.2       | 22.8           | 33.9 | 86.2                      | 50               | 40               | 10               | Loam            |
| 97                        | 2452.9                         | 99.5                         | 2450.4                            | 0.44            | 1.49          | 0.29              | 9.3       | 15.6           | 25.8 | 135                       | 20               | 65               | 15               | Silt Loam       |
| 99.5                      | 2450.4                         | 105                          | 2444.9                            | 0.45            | 1.22          | 0.24              | 9.4       | 12             | 20.4 | 70.7                      | 81.3             | 9.9              | 8.8              | Loamy Sand      |
| 105                       | 2444.9                         | 107.5                        | 2442.4                            | 0.42            | 1.99          | 0.26              | 9.5       | 20.1           | 34.6 | 67.5                      | 75               | 12.5             | 12.5             | Sandy Loam      |
| 109.6                     | 2440.3                         | 112.5                        | 2437.4                            | 0.29            | 1.23          | 0.22              | 9.4       | 14             | 27.7 | 148                       | 22.5             | 60               | 17.5             | Silt Loam       |
| 112.5                     | 2437.4                         | 114.6                        | 2435.3                            | 0.34            | 1.22          | 0.21              | 9.4       | 11.6           | 22   | 65.1                      | 75               | 12.5             | 12.5             | Sandy Loam      |
| 116.5                     | 2433.4                         | 118.5                        | 2431.4                            | 0.53            | 1.55          | 0.32              | 9.6       | 17.2           | 26.4 | 131                       | 42.5             | 35               | 22.5             | Loam            |
| 118.5                     | 2431.4                         | 123.5                        | 2426.4                            | 0.31            | 1.23          | 0.18              | 9.4       | 12.3           | 24.9 | 84.6                      | 73.8             | 12.4             | 13.8             | Sandy Loam      |
| 123.5                     | 2426.4                         | 128.5                        | 2421.4                            | 0.53            | 2.48          | 0.32              | 9.6       | 28.3           | 43.4 | 53.1                      | 77.5             | 12.5             | 10               | Sandy Loam      |
| 128.5                     | 2421.4                         | 132                          | 2417.9                            | 0.46            | 1.70          | 0.3               | 9.6       | 19.6           | 31.9 | 58.6                      | 75               | 15               | 10               | Sandy Loam      |
| 132                       | 2417.9                         | 136                          | 2413.9                            | 1.46            | 1.20          | 0.17              | 9.0       | 11.8           | 13   | 55.9                      | 30               | 37.5             | 32.5             | Clay Loam       |
| 136                       | 2413.9                         | 138                          | 2411.9                            | 1.97            | 0.89          | 1.21              | 9.5       | 9.74           | 7.73 | 86.9                      | 77.5             | 15               | 7.5              | Sandy Loam      |
| 138                       | 2411.9                         | 143                          | 2406.9                            | 0.47            | 0.68          | 0.26              | 9.2       | 7.2            | 12   | 126                       | 43.8             | 34.9             | 21.3             | Loam            |
| 144                       | 2405.9                         | 149                          | 2400.9                            | 0.49            | 0.79          | 0.34              | 9.3       | 8.69           | 13.4 | 77.3                      | 72.5             | 15               | 12.5             | Sandy Loam      |
| 150                       | 2399.9                         | 155                          | 2394.9                            | 0.69            | 0.96          | 0.7               | 9.3       | 9.18           | 11   | 203                       | 2.5              | 48.7             | 48.8             | Silty Clay      |
| 157                       | 2392.9                         | 160                          | 2389.9                            | 0.52            | 1.89          | 0.63              | 9.3       | 19.3           | 25.4 | 201                       | 8.8              | 49.9             | 41.3             | Silty Clay      |
| 162                       | 2387.9                         | 167                          | 2382.9                            | 0.3             | 1.08          | 0.23              | 9.4       | 11.1           | 21.5 | 154                       | 17.5             | 57.5             | 25               | Silt Loam       |
| 167                       | 2382.9                         | 172                          | 2377.9                            | 0.38            | 1.73          | 0.37              | 9.2       | 17.7           | 28.8 | 133                       | 17.5             | 62.5             | 20               | Silt Loam       |
| 172                       | 2377.9                         | 177                          | 2372.9                            | 0.4             | 1.03          | 0.24              | 9.3       | 9.97           | 17.7 | 132                       | 11.3             | 69.9             | 18.8             | Silt Loam       |
| 179                       | 2370.9                         | 185                          | 2364.9                            | 0.46            | 1.70          | 0.34              | 9.2       | 19.7           | 31   | 166                       | 13.8             | 58.7             | 27.5             | Silty Clay Loam |
| 185                       | 2364.9                         | 190                          | 2359.9                            | 0.48            | 1.90          | 0.38              | 9.2       | 22.8           | 34.7 | 169                       | 7.5              | 55               | 37.5             | Silty Clay Loam |
| 195                       | 2354.9                         | 200                          | 2349.9                            | 0.62            | 2.18          | 0.43              | 9.1       | 25.7           | 35.5 | 157                       | 10               | 52.5             | 37.5             | Silty Clay Loam |
| 200                       | 2349.9                         | 205                          | 2344.9                            | 0.27            | 1.01          | 0.21              | 9.3       | 10.6           | 21.6 | 173                       | 15               | 50               | 35               | Silty Clay Loam |
| 206                       | 2343.9                         | 210                          | 2339.9                            | 0.65            | 2.11          | 0.5               | 9.2       | 25.1           | 33   | 140                       | 10               | 60               | 30               | Silty Clay Loam |
| 210                       | 2339.9                         | 215                          | 2334.9                            | 0.6             | 1.96          | 0.38              | 9.0       | 23.5           | 33.5 | 167                       | 5                | 37.5             | 57.5             | Clay            |
| 216                       | 2333.9                         | 221                          | 2328.9                            | 1.26            | 0.83          | 0.92              | 8.1       | 20             | 19.1 | 117                       | 10               | 43.7             | 46.3             | Silty Clay      |
| 243                       | 2306.9                         | 248                          | 2301.9                            | 0.5             | 0.78          | 0.31              | 9.2       | 8.56           | 13.4 | 170                       | 5                | 50               | 45               | Silty Clay      |
| 248                       | 2301.9                         | 252                          | 2297.9                            | 0.42            | 0.80          | 0.12              | 9.3       | 8.41           | 16.2 | 171                       | 2.5              | 55               | 42.5             | Silty Clay      |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.27 | 0.68 | 0.12 | 7.5 | 4.7  | 2.1  | 32.7 | 2.5  | 9.9  | 6.3  |
| Average | 3.09 | 1.77 | 2.91 | 8.9 | 15.1 | 19.0 | 104  | 36   | 40   | 24   |
| Max     | 25.1 | 6.57 | 38.7 | 9.6 | 39.7 | 43.4 | 203  | 81.3 | 69.9 | 62.5 |
| Number  | 44   | 44   | 44   | 44  | 44   | 44   | 44   | 44   | 44   | 44   |

Depth to Coal: 54.5'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 4.5  | 1.28 | 3.28 | 7.5 | 4.7  | 2.1  | 32.7 | 12.5 | 25   | 6.3  |
| Average | 10.6 | 2.67 | 10.5 | 7.9 | 11.5 | 3.5  | 44.6 | 38   | 40   | 22   |
| Max     | 25.1 | 6.57 | 38.7 | 8.1 | 33.9 | 6.17 | 66.4 | 61.3 | 61.2 | 62.5 |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11   | 11   | 11   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.4

OVERBURDEN ANALYSIS DATA FOR SHMW-10D2

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2501.9                         | 5                            | 2496.9                            | 2.78            | 0.53          | 1.61              | 7.6       | 1.04           | 0.7  | 65.3                      | 23.8             | 41.2             | 35               | Clay Loam       |
| 5                         | 2496.9                         | 10                           | 2491.9                            | 17.7            | 9.59          | 31.5              | 8.3       | 84             | 16.9 | 119                       | 25               | 46.2             | 28.8             | Clay Loam       |
| 10                        | 2491.9                         | 15                           | 2486.9                            | 3.97            | 9.02          | 15.6              | 8.5       | 97.6           | 31.2 | 70.8                      | 48.8             | 32.4             | 18.8             | Loam            |
| 15                        | 2486.9                         | 20                           | 2481.9                            | 5.67            | 7.79          | 11.9              | 8.4       | 79.7           | 26.9 | 68.9                      | 56.3             | 26.2             | 17.5             | Sandy Loam      |
| 20                        | 2481.9                         | 25                           | 2476.9                            | 1.84            | 4.95          | 3.49              | 8.4       | 46             | 28.2 | 49.1                      | 48.8             | 31.2             | 20               | Loam            |
| 25                        | 2476.9                         | 30                           | 2471.9                            | 2.31            | 4.84          | 3.51              | 8.4       | 46.3           | 27.1 | 68.1                      | 67.5             | 16.2             | 16.3             | Sandy Loam      |
| 30                        | 2471.9                         | 35                           | 2466.9                            | 2.84            | 4.55          | 4.16              | 8.1       | 38.9           | 20.8 | 57.1                      | 70               | 13.7             | 16.3             | Sandy Loam      |
| 35                        | 2466.9                         | 38                           | 2463.9                            | 2.81            | 3.85          | 3.88              | 8.8       | 31.9           | 17.4 | 95.7                      | 58.8             | 21.2             | 20               | Sandy Loam      |
| 56                        | 2445.9                         | 60                           | 2441.9                            | 0.3             | 0.77          | 0.22              | 9.0       | 7.18           | 14   | 122                       | 10               | 63.7             | 26.3             | Silt Loam       |
| 60                        | 2441.9                         | 65                           | 2436.9                            | 0.52            | 1.95          | 0.44              | 9.2       | 20.3           | 29.4 | 153                       | 11.3             | 59.9             | 28.8             | Silty Clay Loam |
| 65                        | 2436.9                         | 75                           | 2426.9                            | 0.36            | 1.46          | 0.35              | 8.4       | 14             | 23.6 | 185                       | 13.8             | 28.7             | 57.5             | Clay            |
| 75                        | 2426.9                         | 80                           | 2421.9                            | 0.3             | 1.19          | 0.23              | 8.8       | 11.2           | 21.8 | 191                       | 6.3              | 33.7             | 60               | Clay            |
| 80                        | 2421.9                         | 86                           | 2415.9                            | 0.22            | 1.14          | 0.16              | 9.1       | 11             | 25.2 | 167                       | 20               | 38.7             | 41.3             | Clay            |
| 86                        | 2415.9                         | 90                           | 2411.9                            | 0.35            | 1.55          | 0.62              | 9.6       | 14.9           | 21.4 | 112                       | 26.3             | 53.7             | 20               | Loam            |
| 92                        | 2409.9                         | 95                           | 2406.9                            | 0.44            | 0.99          | 0.91              | 9.2       | 9.81           | 11.9 | 161                       | 11.3             | 47.4             | 41.3             | Silty Clay      |
| 95                        | 2406.9                         | 105                          | 2396.9                            | 0.76            | 0.6           | 0.83              | 9.4       | 19             | 21.4 | 149                       | 13.8             | 62.4             | 23.8             | Silt Loam       |
| 105                       | 2396.9                         | 108                          | 2393.9                            | 0.27            | 0.86          | 0.29              | 9.4       | 14.5           | 27.5 | 157                       | 18.8             | 58.7             | 22.5             | Silt Loam       |
| 108                       | 2393.9                         | 115                          | 2386.9                            | 0.46            | 1.33          | 0.32              | 9.3       | 15.6           | 25   | 105                       | 60               | 22.5             | 17.5             | Sandy Loam      |
| 115                       | 2386.9                         | 123                          | 2378.9                            | 0.38            | 0.84          | 0.31              | 9.3       | 8.68           | 14.7 | 143                       | 17.5             | 58.8             | 23.8             | Silt Loam       |
| 123                       | 2378.9                         | 130                          | 2371.9                            | 0.3             | 0.87          | 0.33              | 9.1       | 8.27           | 14.7 | 154                       | 12.5             | 58.8             | 28.8             | Silty Clay Loam |
| 130                       | 2371.9                         | 135                          | 2366.9                            | 0.35            | 0.77          | 0.28              | 8.9       | 8.13           | 14.5 | 150                       | 5                | 58.8             | 36.3             | Silty Clay Loam |
| 135                       | 2366.9                         | 140                          | 2361.9                            | 0.36            | 1.04          | 0.3               | 8.8       | 9.65           | 16.8 | 151                       | 11.3             | 46.3             | 42.5             | Silty Clay      |
| 142                       | 2359.9                         | 148                          | 2353.9                            | 0.33            | 1.04          | 0.24              | 8.5       | 11.5           | 21.6 | 154                       | 2.5              | 50               | 47.5             | Silty Clay      |
| 148                       | 2353.9                         | 155                          | 2346.9                            | 0.27            | 1.09          | 0.42              | 8.8       | 10.9           | 18.6 | 123                       | 5                | 52.5             | 42.5             | Silty Clay      |
| 155                       | 2346.9                         | 162                          | 2339.9                            | 0.28            | 1.24          | 0.28              | 8.9       | 13.7           | 25.8 | 131                       | 3.8              | 53.8             | 42.5             | Silty Clay      |
| 162                       | 2339.9                         | 166                          | 2335.9                            | 2.13            | 1.02          | 22.3              | 8.5       | 12.5           | 3.59 | 138                       | 3.8              | 31.3             | 65               | Clay            |
| 185                       | 2316.9                         | 195                          | 2306.9                            | 0.35            | 0.58          | 0.75              | 9.4       | 5.69           | 7.67 | 175                       | 10               | 48.8             | 41.3             | Silty Clay      |
| 195                       | 2306.9                         | 204                          | 2297.9                            | 0.43            | 0.84          | 0.3               | 9.2       | 8.37           | 13.8 | 254                       | 6.3              | 48.8             | 45               | Silty Clay      |
| 210                       | 2291.9                         | 215                          | 2286.9                            | 0.44            | 0.72          | 0.37              | 9.1       | 7.47           | 11.7 | 196                       | 12.5             | 42.5             | 45               | Silty Clay      |
| 215                       | 2286.9                         | 224                          | 2277.9                            | 0.36            | 0.97          | 0.27              | 9.0       | 9.55           | 17   | 227                       | 5                | 46.3             | 48.8             | Silty Clay      |
| 224                       | 2277.9                         | 234                          | 2267.9                            | 0.48            | 0.48          | 0.52              | 9.3       | 4.18           | 5.94 | 183                       | 30               | 42.5             | 27.5             | Clay Loam       |
| 235                       | 2266.9                         | 240                          | 2261.9                            | 0.26            | 0.85          | 0.2               | 9.0       | 8.58           | 18   | 174                       | 7.5              | 56.3             | 36.3             | Silty Clay Loam |
| 240                       | 2261.9                         | 250                          | 2251.9                            | 0.43            | 0.72          | 0.35              | 9.4       | 6.81           | 10.8 | 181                       | 15               | 57.5             | 27.5             | Silty Clay Loam |
| 255                       | 2246.9                         | 265                          | 2236.9                            | 0.49            | 0.76          | 5.69              | 9.5       | 9.43           | 5.37 | 123                       | 50               | 26.3             | 23.8             | Sandy Clay Loam |
| 267                       | 2234.9                         | 277                          | 2224.9                            | 0.58            | 0.61          | 0.47              | 9.4       | 25             | 34.6 | 90.8                      | 55               | 25               | 20               | Sandy Loam      |
| 282.5                     | 2219.4                         | 287.5                        | 2214.4                            | 1.25            | 0.74          | 0.97              | 9.1       | 23.7           | 22.5 | 97.3                      | 3.8              | 67.5             | 28.8             | Silty Clay Loam |
| 288                       | 2213.9                         | 292                          | 2209.9                            | 0.57            | 1.15          | 0.33              | 8.9       | 11.1           | 16.6 | 71.8                      | 12.5             | 55               | 32.5             | Silty Clay Loam |
| 294                       | 2207.9                         | 299                          | 2202.9                            |                 |               |                   | 9.0       |                |      | 74.6                      | 5                | 70               | 25               | Silt Loam       |
| 308                       | 2193.9                         | 312                          | 2189.9                            | 0.25            | 0.83          | 0.13              | 9.0       | 7.78           | 17.9 | 72.4                      | 5                | 67.5             | 27.5             | Silty Clay Loam |
| 315                       | 2186.9                         | 320                          | 2181.9                            | 1.34            | 1.07          | 0.61              | 8.9       | 8.03           | 8.13 | 70.1                      | 7.5              | 65               | 27.5             | Silty Clay Loam |
| 321                       | 2180.9                         | 326                          | 2175.9                            | 0.62            | 4.07          | 0.63              | 8.0       | 42.2           | 53.5 | 114                       | 5                | 45               | 50               | Silty Clay      |
| 334                       | 2167.9                         | 335                          | 2166.9                            | 0.71            | 1.18          | 0.73              | 8.5       | 12.2           | 14.4 | 90                        | 12.5             | 53.7             | 33.8             | Silty Clay Loam |
| 335                       | 2166.9                         | 338                          | 2163.9                            | 0.33            | 1.01          | 0.21              | 9.2       | 11.2           | 21.5 | 69                        | 12.5             | 65               | 22.5             | Silt Loam       |
| 346                       | 2155.9                         | 351                          | 2150.9                            | 0.34            | 1.3           | 0.45              | 9.0       | 14             | 22.3 | 63.6                      | 8.8              | 67.4             | 23.8             | Silt Loam       |
| 356                       | 2145.9                         | 361                          | 2140.9                            | 0.27            | 1.54          | 0.18              | 9.0       | 13.9           | 29.2 | 34                        | 35               | 52.5             | 12.5             | Silt Loam       |
| 379                       | 2122.9                         | 383                          | 2118.9                            | 0.44            | 1.14          | 0.33              | 9.0       | 11.8           | 19   | 115                       | 8.8              | 46.2             | 45               | Silty Clay      |
| 382                       | 2119.9                         | 387                          | 2114.9                            | 0.34            | 1.19          | 0.69              | 8.9       | 13.1           | 18.2 | 60.6                      | 5                | 62.5             | 32.5             | Silty Clay Loam |
| 384                       | 2117.9                         | 389                          | 2112.9                            | 0.2             | 1.62          | 0.13              | 8.6       | 16.8           | 41.5 | 55                        | 5                | 73.7             | 21.3             | Silt Loam       |
| 390                       | 2111.9                         | 400                          | 2101.9                            | 28.2            | 6.82          | 16.6              | 8.3       | 137            | 28.9 | 92.7                      | 1.3              | 51.2             | 47.5             | Silty Clay      |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.2  | 0.48 | 0.13 | 7.6 | 1.04 | 0.7  | 34.0 | 1.3 | 13.7 | 12.5 |
| Average | 1.81 | 1.98 | 2.82 | 8.9 | 22.0 | 20.0 | 121  | 20  | 48   | 32   |
| Max     | 28.2 | 9.59 | 31.5 | 9.6 | 137  | 53.5 | 254  | 70  | 73.7 | 65   |
| Number  | 48   | 48   | 48   | 49  | 48   | 48   | 49   | 49  | 49   | 49   |

Depth to Coal: 37.4'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 1.84 | 0.53 | 1.61 | 7.6 | 1.04 | 0.7  | 49.1 | 23.8 | 13.7 | 16.3 |
| Average | 5    | 6    | 9    | 8   | 53   | 21   | 74   | 50   | 29   | 22   |
| Max     | 17.7 | 9.59 | 31.5 | 8.8 | 97.6 | 31.2 | 119  | 70   | 46.2 | 35   |
| Number  | 8    | 8    | 8    | 8   | 8    | 8    | 8    | 8    | 8    | 8    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.5

OVERBURDEN ANALYSIS DATA FOR SHMW-12D

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2558.6                         | 5                            | 2553.6                            | 17.7            | 13.9          | 35.8              | 7.5       | 181            | 35   | 116                       | 0                | 70               | 30               | Silty Clay Loam |
| 5                         | 2553.6                         | 8                            | 2550.6                            | 4.81            | 6.42          | 11.5              | 7.6       | 66.9           | 23.4 | 110                       | 12.5             | 60               | 27.5             | Silty Clay Loam |
| 8                         | 2550.6                         | 11                           | 2547.6                            | 1.31            | 4.17          | 3.92              | 8.4       | 46.3           | 28.6 | 109                       | 2.5              | 57.5             | 40               | Silty Clay Loam |
| 11                        | 2547.6                         | 14.5                         | 2544.1                            | 2.25            | 4.72          | 3.28              | 8.6       | 52.4           | 31.5 | 89.7                      | 42.5             | 35               | 22.5             | Loam            |
| 14.5                      | 2544.1                         | 19                           | 2539.6                            | 0.97            | 4.05          | 2.01              | 8.6       | 46.4           | 38   | 107                       | 11.3             | 56.2             | 32.5             | Silty Clay Loam |
| 19                        | 2539.6                         | 24                           | 2534.6                            | 0.58            | 2.53          | 0.66              | 9.0       | 23.4           | 29.6 | 132                       | 7.5              | 60               | 32.5             | Silty Clay Loam |
| 24                        | 2534.6                         | 29                           | 2529.6                            | 0.48            | 1.86          | 0.53              | 9.0       | 17.6           | 24.9 | 132                       | 2.5              | 63.7             | 33.8             | Silty Clay Loam |
| 29                        | 2529.6                         | 33                           | 2525.6                            | 0.51            | 1.93          | 0.5               | 8.9       | 20.7           | 29   | 125                       | 5                | 58.7             | 36.3             | Silty Clay Loam |
| 33                        | 2525.6                         | 35                           | 2523.6                            | 0.31            | 1.46          | 0.15              | 8.6       | 14.4           | 29.9 | 55.4                      | 27.5             | 35               | 37.5             | Clay Loam       |
| 35.5                      | 2523.1                         | 39                           | 2519.6                            | 1.07            | 4.07          | 1.2               | 6.8       | 44.8           | 41.9 | 84.8                      | 80               | 8.7              | 11.3             | Sandy Loam      |
| 39                        | 2519.6                         | 44                           | 2514.6                            | 0.39            | 1.9           | 0.49              | 8.9       | 19             | 28.6 | 100                       | 7.5              | 55               | 37.5             | Silty Clay Loam |
| 44                        | 2514.6                         | 49                           | 2509.6                            | 0.18            | 1.57          | 0.22              | 9.0       | 15.2           | 33.9 | 136                       | 6.3              | 48.7             | 45               | Silty Clay      |
| 49                        | 2509.6                         | 54                           | 2504.6                            | 0.29            | 1.2           | 0.32              | 9.0       | 11.3           | 20.3 | 138                       | 17.5             | 42.5             | 40               | Silty Clay Loam |
| 54                        | 2504.6                         | 59                           | 2499.6                            | 0.54            | 3.07          | 0.84              | 8.5       | 35.2           | 42.3 | 88                        | 25               | 48.7             | 26.3             | Loam            |
| 59                        | 2499.6                         | 64                           | 2494.6                            | 0.32            | 1.32          | 0.33              | 9.3       | 13.6           | 23.9 | 195                       | 1.3              | 36.2             | 62.5             | Clay            |
| 64                        | 2494.6                         | 66                           | 2492.6                            | 0.28            | 1.25          | 0.37              | 8.8       | 12             | 21   | 158                       | 12.5             | 32.5             | 55               | Clay            |
| 66                        | 2492.6                         | 70                           | 2488.6                            | 0.46            | 3.13          | 0.6               | 7.2       | 32.5           | 44.6 | 99.1                      | 80               | 15               | 5                | Loamy Sand      |
| 70                        | 2488.6                         | 75                           | 2483.6                            | 0.27            | 1.18          | 0.39              | 9.0       | 11.4           | 19.9 | 107                       | 6.3              | 58.7             | 35               | Silty Clay Loam |
| 75                        | 2483.6                         | 80                           | 2478.6                            | 0.43            | 2.28          | 0.5               | 8.9       | 25.6           | 37.4 | 72.9                      | 15               | 62.5             | 22.5             | Silt Loam       |
| 80                        | 2478.6                         | 81.5                         | 2477.1                            | 135             | 15.5          | 92.8              | 6.9       | 325            | 30.5 | 94.9                      | 67.5             | 21.2             | 11.3             | Sandy Loam      |
| 81.5                      | 2477.1                         | 86                           | 2472.6                            | 0.35            | 1.33          | 0.35              | 8.9       | 12.8           | 21.7 | 152                       | 0                | 62.5             | 37.5             | Silty Clay Loam |
| 86                        | 2472.6                         | 90                           | 2468.6                            | 0.36            | 1.19          | 0.33              | 9.1       | 12.1           | 20.5 | 175                       | 2.5              | 47.5             | 50               | Silty Clay      |
| 90                        | 2468.6                         | 95                           | 2463.6                            | 0.28            | 1.49          | 0.3               | 9.5       | 15.2           | 28.1 | 83.9                      | 71.3             | 13.7             | 15               | Sandy Loam      |
| 95                        | 2463.6                         | 100                          | 2458.6                            | 0.37            | 1.49          | 0.36              | 9.4       | 16.7           | 27.6 | 72.3                      | 66.3             | 17.4             | 16.3             | Sandy Loam      |
| 100                       | 2458.6                         | 105                          | 2453.6                            | 0.42            | 1.6           | 0.48              | 9.4       | 15.9           | 23.6 | 57.3                      | 71.3             | 14.9             | 13.8             | Sandy Loam      |
| 105                       | 2453.6                         | 110                          | 2448.6                            | 0.42            | 0.66          | 0.81              | 9.4       | 7.65           | 9.78 | 58.5                      | 68.8             | 16.2             | 15               | Sandy Loam      |
| 110                       | 2448.6                         | 115                          | 2443.6                            | 0.47            | 0.58          | 0.9               | 9.3       | 6.15           | 7.43 | 60.7                      | 66.3             | 18.7             | 15               | Sandy Loam      |
| 115                       | 2443.6                         | 120                          | 2438.6                            | 2.34            | 2.68          | 3.22              | 8.5       | 27.9           | 16.7 | 50.1                      | 71.3             | 16.2             | 12.5             | Sandy Loam      |
| 120                       | 2438.6                         | 122                          | 2436.6                            | 0.22            | 0.57          | 0.33              | 8.7       | 5.57           | 10.6 | 129                       | 6.3              | 56.2             | 37.5             | Silty Clay Loam |
| 138                       | 2420.6                         | 143                          | 2415.6                            | 4.64            | 1.42          | 11.9              | 7.1       | 20.4           | 7.1  | 103                       | 2.5              | 37.5             | 60               | Clay            |
| 143                       | 2415.6                         | 148                          | 2410.6                            | 0.43            | 0.98          | 0.44              | 9.3       | 10.1           | 15.2 | 108                       | 13.8             | 61.2             | 25               | Silt Loam       |
| 148                       | 2410.6                         | 153                          | 2405.6                            | 0.28            | 0.8           | 0.36              | 9.6       | 8.34           | 14.7 | 119                       | 26.3             | 47.4             | 26.3             | Loam            |
| 153                       | 2405.6                         | 156                          | 2402.6                            | 0.2             | 0.94          | 0.39              | 8.9       | 9.91           | 18.3 | 163                       | 0                | 25               | 75               | Clay            |
| 158                       | 2400.6                         | 163                          | 2395.6                            | 0.22            | 0.97          | 0.49              | 9.2       | 10.7           | 18   | 156                       | 2.5              | 45               | 52.5             | Silty Clay      |
| 163                       | 2395.6                         | 168                          | 2390.6                            | 0.39            | 1.66          | 0.49              | 8.6       | 16.6           | 24.8 | 132                       | 37.5             | 46.2             | 16.3             | Loam            |
| 168                       | 2390.6                         | 173                          | 2385.6                            | 0.38            | 1.24          | 0.37              | 9.3       | 12.2           | 19.9 | 94.2                      | 46.3             | 48.7             | 5                | Sandy Loam      |
| 173                       | 2385.6                         | 178                          | 2380.6                            | 0.28            | 1.02          | 0.3               | 9.6       | 10             | 18.6 | 95.8                      | 61.3             | 36.2             | 2.5              | Sandy Loam      |
| 178                       | 2380.6                         | 182                          | 2376.6                            | 0.27            | 1.01          | 0.29              | 9.2       | 9.45           | 17.9 | 121                       | 17.5             | 65               | 17.5             | Silt Loam       |
| 182.5                     | 2376.1                         | 187.5                        | 2371.1                            | 0.33            | 0.82          | 0.36              | 9.3       | 8.06           | 13.8 | 135                       | 6.3              | 64.9             | 28.8             | Silty Clay Loam |
| 191                       | 2367.6                         | 195.5                        | 2363.1                            | 0.47            | 1.23          | 0.24              | 9.0       | 14.3           | 24   | 130                       | 13.8             | 53.7             | 32.5             | Silty Clay      |
| 196.5                     | 2362.1                         | 202.5                        | 2356.1                            | 0.52            | 1.05          | 0.28              | 8.6       | 10.3           | 16.3 | 153                       | 2.5              | 38.7             | 58.8             | Clay            |
| 203.5                     | 2355.1                         | 207                          | 2351.6                            | 0.39            | 0.69          | 0.72              | 9.4       | 8.42           | 11.3 | 91                        | 1.3              | 58.7             | 40               | Silty Clay Loam |
| 213                       | 2345.6                         | 216.5                        | 2342.1                            | 0.64            | 0.89          | 0.34              | 9.0       | 9.42           | 13.4 | 140                       | 22.5             | 52.5             | 25               | Silt Loam       |
| 216.5                     | 2342.1                         | 220                          | 2338.6                            | 0.79            | 0.91          | 1.75              | 9.5       | 10.6           | 9.39 | 148                       | 38.8             | 41.2             | 20               | Loam            |
| 220                       | 2338.6                         | 225                          | 2333.6                            | 0.48            | 0.91          | 0.32              | 9.1       | 10.2           | 16.2 | 125                       | 6.3              | 63.7             | 30               | Silty Clay Loam |
| 225                       | 2333.6                         | 230                          | 2328.6                            | 0.63            | 1.16          | 0.61              | 8.8       | 11.8           | 15   | 113                       | 0                | 50               | 50               | Silty Clay      |
| 230                       | 2328.6                         | 235                          | 2323.6                            | 0.72            | 0.93          | 0.46              | 9.0       | 9.02           | 11.8 | 127                       | 5                | 52.5             | 42.5             | Silty Clay      |
| 235                       | 2323.6                         | 240                          | 2318.6                            | 0.56            | 1.07          | 0.42              | 8.8       | 10.5           | 14.9 | 124                       | 0                | 57.5             | 42.5             | Silty Clay      |
| 240                       | 2318.6                         | 245                          | 2313.6                            | 0.61            | 1.03          | 0.98              | 8.8       | 11.8           | 13.3 | 136                       | 0                | 42.5             | 57.5             | Silty Clay      |
| 245                       | 2313.6                         | 250                          | 2308.6                            | 22              | 0.98          | 22.9              | 8.2       | 10.1           | 2.14 | 106                       | 3.8              | 47.4             | 48.8             | Silty Clay      |

Statistical Summary

|         |      |      |      |     |      |      |      |    |     |     |
|---------|------|------|------|-----|------|------|------|----|-----|-----|
| Min     | 0.18 | 0.57 | 0.15 | 6.8 | 5.57 | 2.14 | 50.1 | 0  | 8.7 | 2.5 |
| Average | 4.17 | 2.22 | 4.16 | 8.8 | 27.3 | 21.9 | 114  | 23 | 44  | 32  |
| Max     | 135  | 15.5 | 92.8 | 9.6 | 325  | 44.6 | 195  | 80 | 70  | 75  |
| Number  | 50   | 50   | 50   | 50  | 50   | 50   | 50   | 50 | 50  | 50  |

Depth to Coal: 122'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |    |     |      |
|---------|------|------|------|-----|------|------|------|----|-----|------|
| Min     | 0.18 | 0.57 | 0.15 | 6.8 | 5.57 | 7.43 | 50.1 | 0  | 8.7 | 5    |
| Average | 5.98 | 3.07 | 5.64 | 8.6 | 39.1 | 26.9 | 107  | 29 | 41  | 30   |
| Max     | 135  | 15.5 | 92.8 | 9.5 | 325  | 44.6 | 195  | 80 | 70  | 62.5 |
| Number  | 29   | 29   | 29   | 29  | 29   | 29   | 29   | 29 | 29  | 29   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.6

OVERBURDEN ANALYSIS DATA FOR SHOB-01R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2542.4                         | 5                            | 2537.4                            | 22.2            | 9.58          | 39.6              | 7.5       | 96.3           | 17.3 | 115                       | 2.5              | 52.5             | 45               | Silty Clay      |
| 5                         | 2537.4                         | 10                           | 2532.4                            | 21.2            | 9.14          | 43.5              | 8.0       | 89.7           | 15.8 | 129                       | 5                | 50               | 45               | Silty Clay      |
| 10                        | 2532.4                         | 15                           | 2527.4                            | 23.4            | 8             | 86                | 6.3       | 69.5           | 9.39 | 122                       | 2.5              | 37.5             | 60               | Clay            |
| 15                        | 2527.4                         | 20                           | 2522.4                            | 18              | 6.19          | 46.6              | 6.5       | 73.5           | 12.9 | 80.4                      | 27.5             | 45               | 27.5             | Clay Loam       |
| 20                        | 2522.4                         | 25                           | 2517.4                            | 4.52            | 2.9           | 7.52              | 8.1       | 26.1           | 10.6 | 102                       | 2.5              | 55               | 42.5             | Silty Clay      |
| 25                        | 2517.4                         | 30                           | 2512.4                            | 2.3             | 2.47          | 3.25              | 8.3       | 25.3           | 15.2 | 143                       | 5                | 53.7             | 41.3             | Silty Clay      |
| 30                        | 2512.4                         | 35                           | 2507.4                            | 2.25            | 2.55          | 3.09              | 8.9       | 34.4           | 21.1 | 112                       | 42.5             | 33.7             | 23.8             | Loam            |
| 35                        | 2507.4                         | 40                           | 2502.4                            | 0.98            | 2.73          | 0.93              | 9.0       | 21.5           | 21.9 | 131                       | 20               | 52.5             | 27.5             | Clay Loam       |
| 40                        | 2502.4                         | 45                           | 2497.4                            | 2.29            | 4.22          | 3.22              | 9.0       | 78.8           | 47.5 | 102                       | 22.5             | 50               | 27.5             | Silt Loam       |
| 45                        | 2497.4                         | 50                           | 2492.4                            | 1.38            | 4.01          | 1.53              | 9.0       | 41.1           | 34.1 | 88.2                      | 55               | 23.7             | 21.3             | Sandy Clay Loam |
| 50                        | 2492.4                         | 55                           | 2487.4                            | 1.39            | 2.13          | 1.73              | 9.1       | 39.1           | 31.3 | 119                       | 41.3             | 31.2             | 27.5             | Clay Loam       |
| 75                        | 2467.4                         | 80                           | 2462.4                            | 1.03            | 2             | 1.04              | 8.4       | 21.9           | 21.6 | 149                       | 8.8              | 51.2             | 40               | Silty Clay Loam |
| 80                        | 2462.4                         | 85                           | 2457.4                            | 0.64            | 1.52          | 0.49              | 9.2       | 14.1           | 18.8 | 161                       | 7.5              | 55               | 37.5             | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.64 | 1.52 | 0.49 | 6.3 | 14.1 | 9.39 | 80.4 | 2.5 | 23.7 | 21.3 |
| Average | 7.81 | 4.42 | 18.3 | 8.3 | 48.6 | 21.3 | 120  | 19  | 45   | 36   |
| Max     | 23.4 | 9.58 | 86   | 9.2 | 96.3 | 47.5 | 161  | 55  | 55   | 60   |
| Number  | 13   | 13   | 13   | 13  | 13   | 13   | 13   | 13  | 13   | 13   |

Depth to Coal: 56'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.98 | 2.13 | 0.93 | 6.3 | 21.5 | 9.39 | 80.4 | 2.5 | 23.7 | 21.3 |
| Average | 9.08 | 4.90 | 21.5 | 8.2 | 54.1 | 21.6 | 113  | 21  | 44   | 35   |
| Max     | 23.4 | 9.58 | 86   | 9.1 | 96.3 | 47.5 | 143  | 55  | 55   | 60   |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11  | 11   | 11   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.7

OVERBURDEN ANALYSIS DATA FOR SHOB-02R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2504.9                         | 5                            | 2499.9                            | 3.96            | 1.43          | 3.37              | 8.3       | 9.29           | 4.85 | 84.9                      | 12.5             | 43.7             | 43.8             | Silty Clay      |
| 5                         | 2499.9                         | 10                           | 2494.9                            | 17.4            | 5.28          | 19.8              | 7.7       | 33.6           | 7.79 | 99                        | 20               | 37.5             | 42.5             | Clay            |
| 10                        | 2494.9                         | 15                           | 2489.9                            | 20.4            | 6.11          | 29.3              | 7.6       | 38.9           | 7.81 | 83                        | 23.8             | 42.4             | 33.8             | Clay Loam       |
| 15                        | 2489.9                         | 20                           | 2484.9                            | 16.2            | 5.85          | 34.6              | 7.6       | 31             | 6.15 | 103                       | 10               | 55               | 35               | Silty Clay Loam |
| 20                        | 2484.9                         | 25                           | 2479.9                            | 16.4            | 4.35          | 25.8              | 7.4       | 18             | 3.92 | 98.6                      | 5                | 58.7             | 36.3             | Silty Clay Loam |
| 25                        | 2479.9                         | 30                           | 2474.9                            | 15.7            | 3.66          | 20.8              | 4.8       | 13.7           | 3.21 | 59.7                      | 45               | 26.2             | 28.8             | Sandy Clay Loam |
| 45                        | 2459.9                         | 50                           | 2454.9                            | 0.25            | 1.05          | 0.23              | 8.3       | 10.3           | 21.1 | 174                       | 23.8             | 38.7             | 37.5             | Clay Loam       |
| 50                        | 2454.9                         | 55                           | 2449.9                            | 0.37            | 1.04          | 0.37              | 9.0       | 10.2           | 16.9 | 126                       | 15               | 58.7             | 26.3             | Silt Loam       |
| 55                        | 2449.9                         | 60                           | 2444.9                            | 0.59            | 1.21          | 0.36              | 9.2       | 13.6           | 19.8 | 110                       | 17.5             | 60               | 22.5             | Silt Loam       |
| 60                        | 2444.9                         | 65                           | 2439.9                            | 0.37            | 1.95          | 0.32              | 9.0       | 20.4           | 34.9 | 103                       | 16.3             | 21.3             | 62.4             | Silt Loam       |
| 65                        | 2439.9                         | 70                           | 2434.9                            | 0.44            | 1.89          | 0.4               | 9.2       | 19.7           | 30.3 | 101                       | 20               | 57.5             | 22.5             | Silt Loam       |
| 70                        | 2434.9                         | 75                           | 2429.9                            | 0.26            | 1.37          | 0.18              | 8.9       | 14.4           | 30.6 | 139                       | 1.3              | 57.4             | 41.3             | Silty Clay      |
| 75                        | 2429.9                         | 80                           | 2424.9                            | 0.53            | 1.28          | 0.37              | 8.9       | 12.5           | 18.6 | 156                       | 5                | 40               | 55               | Silty Clay      |
| 80                        | 2424.9                         | 85                           | 2419.9                            | 0.66            | 0.72          | 0.47              | 9.2       | 7.74           | 10.3 | 176                       | 5                | 48.7             | 46.3             | Silty Clay      |
| 85                        | 2419.9                         | 90                           | 2414.9                            | 0.56            | 0.93          | 0.45              | 9.1       | 9.15           | 12.9 | 131                       | 7.5              | 62.5             | 30               | Silty Clay Loam |
| 90                        | 2414.9                         | 95                           | 2409.9                            | 0.61            | 1.07          | 0.32              | 9.0       | 11.2           | 16.4 | 136                       | 8.8              | 61.2             | 30               | Silty Clay Loam |
| 95                        | 2409.9                         | 100                          | 2404.9                            |                 | 0.88          |                   | 9.1       |                |      | 121                       | 7.5              | 32.5             | 60               | Silty Clay Loam |
| 100                       | 2404.9                         | 105                          | 2399.9                            | 0.51            | 0.91          | 0.4               | 8.9       | 8.9            | 13.2 | 140                       | 7.5              | 60               | 32.5             | Silty Clay Loam |
| 105                       | 2399.9                         | 110                          | 2394.9                            | 0.77            | 1.06          | 0.65              | 9.0       | 11             | 13.1 | 131                       | 5                | 57.5             | 37.5             | Silty Clay Loam |
| 110                       | 2394.9                         | 115                          | 2389.9                            | 0.68            | 0.99          | 0.48              | 8.9       | 9.75           | 12.8 | 121                       | 2.5              | 51.2             | 46.3             | Silty Clay      |
| 115                       | 2389.9                         | 120                          | 2384.9                            | 0.41            | 1.55          | 0.33              | 8.9       | 15.9           | 26.1 | 122                       | 0                | 56.2             | 43.8             | Silty Clay      |
| 120                       | 2384.9                         | 125                          | 2379.9                            | 0.31            | 1.23          | 0.37              | 9.4       | 12.8           | 22   | 131                       | 41.3             | 34.9             | 23.8             | Loam            |
| 125                       | 2379.9                         | 130                          | 2374.9                            | 0.25            | 1.33          | 0.26              | 9.1       | 13.7           | 27.2 | 115                       | 13.8             | 49.9             | 36.3             | Silty Clay Loam |
| 130                       | 2374.9                         | 135                          | 2369.9                            | 0.31            | 1.68          | 0.39              | 9.1       | 17.2           | 29.1 | 121                       | 10               | 52.5             | 37.5             | Silty Clay Loam |
| 135                       | 2369.9                         | 140                          | 2364.9                            | 0.44            | 1.68          | 0.38              | 9.1       | 17.5           | 27.2 | 136                       | 17.5             | 42.5             | 40               | Silty Clay      |
| 140                       | 2364.9                         | 145                          | 2359.9                            | 0.36            | 1.33          | 0.21              | 8.3       | 14.6           | 27.3 | 130                       | 6.3              | 32.4             | 61.3             | Clay            |
| 145                       | 2359.9                         | 150                          | 2354.9                            | 0.31            | 1.41          | 0.23              | 9.1       | 14.8           | 28.6 | 157                       | 12.5             | 43.7             | 43.8             | Silty Clay      |
| 150                       | 2354.9                         | 155                          | 2349.9                            | 0.41            | 1.62          | 0.2               | 7.6       | 18.1           | 30.9 | 121                       | 65               | 7.5              | 27.5             | Sandy Clay Loam |
| 155                       | 2349.9                         | 160                          | 2344.9                            | 0.45            | 1.78          | 0.67              | 8.4       | 20.3           | 27.6 | 144                       | 5                | 45               | 50               | Silty Clay      |
| 160                       | 2344.9                         | 165                          | 2339.9                            | 0.28            | 1.28          | 0.41              | 8.9       | 13.5           | 20.7 | 152                       | 2.5              | 38.7             | 58.8             | Clay            |
| 165                       | 2339.9                         | 170                          | 2334.9                            | 0.28            | 1.13          | 0.2               | 9.2       | 11.2           | 22.7 | 156                       | 17.5             | 37.5             | 45               | Clay            |
| 170                       | 2334.9                         | 175                          | 2329.9                            | 0.32            | 1.32          | 0.2               | 9.2       | 13.8           | 27.1 | 174                       | 10               | 51.2             | 38.8             | Silty Clay Loam |
| 175                       | 2329.9                         | 180                          | 2324.9                            | 0.25            | 1.18          | 0.18              | 9.2       | 12.4           | 26.8 | 175                       | 5                | 53.7             | 41.3             | Silty Clay      |
| 180                       | 2324.9                         | 185                          | 2319.9                            | 0.41            | 1.93          | 0.23              | 7.8       | 21.2           | 37.4 | 145                       | 22.5             | 35               | 42.5             | Clay            |
| 195                       | 2309.9                         | 200                          | 2304.9                            | 0.45            | 1.73          | 0.29              | 7.9       | 18.1           | 29.8 | 165                       | 26.3             | 24.9             | 48.8             | Clay            |
| 200                       | 2304.9                         | 205                          | 2299.9                            | 0.29            | 0.85          | 0.18              | 9.3       | 8.56           | 17.6 | 217                       | 10               | 61.2             | 28.8             | Silty Clay Loam |
| 205                       | 2299.9                         | 210                          | 2294.9                            | 0.35            | 1.56          | 0.21              | 8.5       | 16.4           | 31   | 182                       | 10               | 22.5             | 67.5             | Clay            |

Statistical Summary

|         |      |      |      |     |      |      |      |    |      |      |
|---------|------|------|------|-----|------|------|------|----|------|------|
| Min     | 0.25 | 0.72 | 0.18 | 4.8 | 7.74 | 3.21 | 59.7 | 0  | 7.5  | 22.5 |
| Average | 2.85 | 1.83 | 3.99 | 8.6 | 15.6 | 20.7 | 133  | 14 | 45   | 41   |
| Max     | 20.4 | 6.11 | 34.6 | 9.4 | 38.9 | 37.4 | 217  | 65 | 62.5 | 67.5 |
| Number  | 36   | 37   | 36   | 37  | 36   | 36   | 37   | 37 | 37   | 37   |

Depth to Coal: 28'

Statistical Summary Above Coal

|         |       |      |      |     |      |      |      |    |      |      |
|---------|-------|------|------|-----|------|------|------|----|------|------|
| Min     | 3.96  | 1.43 | 3.37 | 4.8 | 9.29 | 3.21 | 59.7 | 5  | 26.2 | 28.8 |
| Average | 15.01 | 4.45 | 22.3 | 7.2 | 24.1 | 5.6  | 88   | 19 | 44   | 37   |
| Max     | 20.4  | 6.11 | 34.6 | 8.3 | 38.9 | 7.81 | 103  | 45 | 58.7 | 43.8 |
| Number  | 6     | 6    | 6    | 6   | 6    | 6    | 6    | 6  | 6    | 6    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.8

OVERBURDEN ANALYSIS DATA FOR SHOB-03R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2565.0                         | 5                            | 2560.0                            | 4.17            | 2.54          | 7.15              | 8.0       | 19.3           | 8.12 | 80.3                      | 18.8             | 49.9             | 31.3             | Silty Clay Loam |
| 5                         | 2560.0                         | 10                           | 2555.0                            | 19.8            | 8.72          | 39                | 8.0       | 83.9           | 15.5 | 98.3                      | 11.3             | 51.2             | 37.5             | Silty Clay Loam |
| 10                        | 2555.0                         | 15                           | 2550.0                            | 12.5            | 6.32          | 24.4              | 7.4       | 58.4           | 13.6 | 139                       | 3.8              | 37.4             | 58.8             | Clay            |
| 15                        | 2550.0                         | 20                           | 2545.0                            | 19.1            | 7.1           | 25.9              | 4.7       | 89.7           | 18.9 | 94.2                      | 21.3             | 29.9             | 48.8             | Clay            |
| 20                        | 2545.0                         | 25                           | 2540.0                            | 16.1            | 6.26          | 22.4              | 6.1       | 46.7           | 10.6 | 85.8                      | 13.8             | 43.7             | 42.5             | Silty Clay      |
| 25                        | 2540.0                         | 30                           | 2535.0                            | 4.73            | 2.99          | 4.72              | 7.6       | 33.1           | 15.2 | 58.3                      | 18.8             | 62.4             | 18.8             | Silt Loam       |
| 30                        | 2535.0                         | 35                           | 2530.0                            | 1.22            | 2.21          | 1.63              | 8.2       | 15.1           | 12.7 | 98.3                      | 13.8             | 51.2             | 35               | Silty Clay Loam |
| 35                        | 2530.0                         | 40                           | 2525.0                            | 0.41            | 1.46          | 0.47              | 8.6       | 39.9           | 60.4 | 122                       | 7.5              | 51.2             | 41.3             | Silty Clay      |
| 40                        | 2525.0                         | 45                           | 2520.0                            | 0.61            | 2.41          | 0.71              | 8.8       | 21.5           | 26.4 | 143                       | 7.5              | 57.5             | 35               | Silty Clay Loam |
| 45                        | 2520.0                         | 50                           | 2515.0                            | 0.35            | 1.6           | 0.32              | 9.1       | 21.8           | 37.7 | 137                       | 11.3             | 58.7             | 30               | Silty Clay Loam |
| 50                        | 2515.0                         | 55                           | 2510.0                            | 0.33            | 1.52          | 0.23              | 9.1       | 18.4           | 34.7 | 160                       | 10               | 47.5             | 42.5             | Silty Clay      |
| 55                        | 2510.0                         | 60                           | 2505.0                            | 0.39            | 2.45          | 0.36              | 7.4       | 22.9           | 37.4 | 115                       | 60               | 21.2             | 18.8             | Sandy Loam      |
| 75                        | 2490.0                         | 80                           | 2485.0                            | 0.22            | 1.29          | 0.15              | 7.9       | 21.7           | 50.8 | 107                       | 55               | 26.2             | 18.8             | Sandy Loam      |
| 80                        | 2485.0                         | 85                           | 2480.0                            | 0.69            | 3.66          | 0.89              | 8.3       | 38.5           | 43.2 | 113                       | 62.5             | 20               | 17.5             | Sandy Loam      |
| 85                        | 2480.0                         | 90                           | 2475.0                            | 0.5             | 3.09          | 0.53              | 8.8       | 38.8           | 54   | 98.9                      | 71.3             | 16.2             | 12.5             | Sandy Loam      |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.22 | 1.29 | 0.15 | 4.7 | 15.1 | 8.12 | 58.3 | 3.8  | 16.2 | 12.5 |
| Average | 5.41 | 3.57 | 8.59 | 7.9 | 38.0 | 29.3 | 110  | 26   | 42   | 33   |
| Max     | 19.8 | 8.72 | 39   | 9.1 | 89.7 | 60.4 | 160  | 71.3 | 62.4 | 58.8 |
| Number  | 15   | 15   | 15   | 15  | 15   | 15   | 15   | 15   | 15   | 15   |

Depth to Coal: 57'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.33 | 1.46 | 0.23 | 4.7 | 15.1 | 8.12 | 58.3 | 3.8 | 21.2 | 18.8 |
| Average | 6.64 | 3.80 | 10.6 | 7.8 | 39.2 | 24.3 | 111  | 16  | 47   | 37   |
| Max     | 19.8 | 8.72 | 39   | 9.1 | 89.7 | 60.4 | 160  | 60  | 62.4 | 58.8 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12  | 12   | 12   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.9

OVERBURDEN ANALYSIS DATA FOR SHOB-04R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2540.7                         | 5                            | 2535.7                            | 25.3            | 6.37          | 41.5              | 7.7       | 37.5           | 6.5  | 97.1                      | 13.8             | 34.9             | 51.3             | Clay            |
| 5                         | 2535.7                         | 10                           | 2530.7                            | 25.6            | 4.93          | 38.7              | 7.7       | 25.5           | 4.5  | 107                       | 6.3              | 48.7             | 45               | Silty Clay      |
| 10                        | 2530.7                         | 15                           | 2525.7                            | 17.1            | 5.29          | 28.4              | 7.9       | 38.5           | 8.07 | 100                       | 17.5             | 48.7             | 33.8             | Silty Clay Loam |
| 15                        | 2525.7                         | 20                           | 2520.7                            | 4.46            | 2.89          | 6.67              | 8.4       | 20.2           | 8.55 | 120                       | 12.5             | 50               | 37.5             | Silty Clay Loam |
| 20                        | 2520.7                         | 25                           | 2515.7                            | 6.11            | 5.7           | 15.2              | 8.4       | 33.8           | 10.4 | 57.1                      | 43.8             | 33.7             | 22.5             | Loam            |
| 25                        | 2515.7                         | 30                           | 2510.7                            | 9.05            | 4.52          | 24.4              | 8.3       | 33.1           | 8.09 | 73.3                      | 60               | 21.2             | 18.8             | Sandy Loam      |
| 30                        | 2510.7                         | 35                           | 2505.7                            | 2.86            | 2.62          | 6.23              | 8.7       | 18.8           | 8.82 | 133                       | 17.5             | 50               | 32.5             | Silty Clay Loam |
| 35                        | 2505.7                         | 40                           | 2500.7                            | 5.31            | 2.89          | 11.1              | 7.5       | 42.6           | 14.9 | 128                       | 37.5             | 37.5             | 25               | Loam            |
| 55                        | 2485.7                         | 60                           | 2480.7                            | 0.7             | 4.13          | 0.69              | 8.6       | 23.9           | 28.6 | 134                       | 20               | 37.5             | 42.5             | Clay            |
| 60                        | 2480.7                         | 65                           | 2475.7                            | 0.62            | 2.39          | 0.54              | 8.9       | 23.2           | 30.4 | 138                       | 5                | 66.2             | 28.8             | Silty Clay Loam |
| 65                        | 2475.7                         | 70                           | 2470.7                            | 0.71            | 2.15          | 0.66              | 9.3       | 24.5           | 29.7 | 150                       | 25               | 46.2             | 28.8             | Clay Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |    |      |      |
|---------|------|------|------|-----|------|------|------|----|------|------|
| Min     | 0.62 | 2.15 | 0.54 | 7.5 | 18.8 | 4.5  | 57.1 | 5  | 21.2 | 18.8 |
| Average | 8.89 | 3.99 | 15.8 | 8.3 | 29.2 | 14.4 | 113  | 24 | 43   | 33   |
| Max     | 25.6 | 6.37 | 41.5 | 9.3 | 42.6 | 30.4 | 150  | 60 | 66.2 | 51.3 |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11 | 11   | 11   |

Depth to Coal: 38'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 2.86 | 2.62 | 6.23 | 7.5 | 18.8 | 4.5  | 57.1 | 6.3 | 21.2 | 18.8 |
| Average | 12.0 | 4.40 | 21.5 | 8.1 | 31.3 | 8.7  | 102  | 26  | 41   | 33   |
| Max     | 25.6 | 6.37 | 41.5 | 8.7 | 42.6 | 14.9 | 133  | 60  | 50   | 51.3 |
| Number  | 8    | 8    | 8    | 8   | 8    | 8    | 8    | 8   | 8    | 8    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.10

OVERBURDEN ANALYSIS DATA FOR SHOB-05R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2525.7                         | 5                            | 2520.7                            | 17.8            | 2             | 7.95              | 7.4       | 1.77           | 0.49 | 100                       | 13.8             | 38.7             | 47.5             | Clay            |
| 5                         | 2520.7                         | 10                           | 2515.7                            | 27.2            | 3.62          | 24.9              | 7.6       | 6.41           | 1.26 | 93.3                      | 5                | 47.5             | 47.5             | Silty Clay      |
| 10                        | 2515.7                         | 15                           | 2510.7                            | 28.4            | 5.8           | 41.6              | 7.4       | 25.9           | 4.37 | 103                       | 12.5             | 30               | 57.5             | Clay            |
| 15                        | 2510.7                         | 20                           | 2505.7                            | 23.8            | 8.3           | 58                | 7.8       | 53.5           | 8.36 | 55.8                      | 17.5             | 58.7             | 23.8             | Silt Loam       |
| 20                        | 2505.7                         | 25                           | 2500.7                            | 22.5            | 8.72          | 59.8              | 8.0       | 59.5           | 9.28 | 48.9                      | 52.5             | 35               | 12.5             | Sandy Loam      |
| 25                        | 2500.7                         | 30                           | 2495.7                            | 10.7            | 6.89          | 23.5              | 7.2       | 61.9           | 15   | 96.9                      | 22.5             | 42.5             | 35               | Clay Loam       |
| 30                        | 2495.7                         | 35                           | 2490.7                            | 2.77            | 4.18          | 6.02              | 8.6       | 39.7           | 18.9 | 113                       | 30               | 42.5             | 27.5             | Clay Loam       |
| 35                        | 2490.7                         | 40                           | 2485.7                            | 1.34            | 4.51          | 2.45              | 8.7       | 47.9           | 34.8 | 125                       | 13.8             | 58.7             | 27.5             | Silty Clay Loam |
| 40                        | 2485.7                         | 45                           | 2480.7                            | 1.87            | 4.43          | 2.99              | 8.2       | 45.6           | 29.3 | 148                       | 27.5             | 37.5             | 35               | Clay Loam       |
| 65                        | 2460.7                         | 70                           | 2455.7                            | 0.47            | 2.78          | 0.49              | 8.1       | 30.1           | 43.5 | 182                       | 10               | 43.7             | 46.3             | Silty Clay      |
| 70                        | 2455.7                         | 75                           | 2450.7                            | 0.7             | 3.72          | 0.66              | 8.6       | 40.2           | 48.8 | 161                       | 0                | 60               | 40               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |    |      |
|---------|------|------|------|-----|------|------|------|------|----|------|
| Min     | 0.47 | 2    | 0.49 | 7.2 | 1.77 | 0.49 | 48.9 | 0    | 30 | 12.5 |
| Average | 12.5 | 5.00 | 20.8 | 8.0 | 37.5 | 19.5 | 112  | 19   | 45 | 36   |
| Max     | 28.4 | 8.72 | 59.8 | 8.7 | 61.9 | 48.8 | 182  | 52.5 | 60 | 57.5 |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11   | 11 | 11   |

Depth to Coal: 47'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 1.34 | 2    | 2.45 | 7.2 | 1.77 | 0.49 | 48.9 | 5    | 30   | 12.5 |
| Average | 15.2 | 5.38 | 25.2 | 7.9 | 38.0 | 13.5 | 98.2 | 22   | 43   | 35   |
| Max     | 28.4 | 8.72 | 59.8 | 8.7 | 61.9 | 34.8 | 148  | 52.5 | 58.7 | 57.5 |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9    | 9    | 9    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.11

OVERBURDEN ANALYSIS DATA FOR SHOB-06BR

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2516.0                         | 5                            | 2511.0                            | 10.8            | 3.11          | 10.9              | 7.8       | 15.3           | 4.64 | 113                       | 20               | 33.7             | 46.3             | Clay            |
| 5                         | 2511.0                         | 10                           | 2506.0                            | 12.5            | 4.26          | 12.2              | 7.8       | 27.9           | 7.95 | 120                       | 31.3             | 18.7             | 50               | Clay            |
| 10                        | 2506.0                         | 15                           | 2501.0                            | 8.16            | 4.57          | 8.77              | 7.9       | 36.3           | 12.5 | 130                       | 10               | 41.2             | 48.8             | Silty Clay      |
| 15                        | 2501.0                         | 20                           | 2496.0                            | 20.4            | 5.85          | 18.6              | 7.7       | 41.1           | 9.31 | 135                       | 10               | 31.2             | 58.8             | Clay            |
| 20                        | 2496.0                         | 25                           | 2491.0                            | 18.2            | 6.37          | 33.8              | 7.8       | 40.8           | 8    | 86.3                      | 28.8             | 31.2             | 40               | Clay Loam       |
| 25                        | 2491.0                         | 30                           | 2486.0                            | 17.3            | 6.52          | 26.8              | 7.9       | 44.6           | 9.5  | 91                        | 35               | 32.5             | 32.5             | Clay Loam       |
| 30                        | 2486.0                         | 35                           | 2481.0                            | 9.75            | 5.59          | 13.4              | 7.9       | 49             | 14.4 | 92                        | 32.5             | 45               | 22.5             | Loam            |
| 35                        | 2481.0                         | 40                           | 2476.0                            | 4.18            | 4.89          | 6.67              | 8.2       | 48.4           | 20.8 | 99.9                      | 52.5             | 27.5             | 20               | Sandy Clay Loam |
| 40                        | 2476.0                         | 45                           | 2471.0                            | 21.8            | 7.17          | 21.9              | 7.8       | 61.6           | 13.2 | 86                        | 31.3             | 41.2             | 27.5             | Clay Loam       |
| 45                        | 2471.0                         | 50                           | 2466.0                            | 11.8            | 5.34          | 12.5              | 7.4       | 48.2           | 13.8 | 135                       | 16.3             | 48.7             | 35               | Silty Clay Loam |
| 65                        | 2451.0                         | 70                           | 2446.0                            | 11.7            | 7.59          | 11.5              | 7.0       | 80.1           | 23.5 | 131                       | 35               | 32.5             | 32.5             | Clay Loam       |
| 70                        | 2446.0                         | 75                           | 2441.0                            | 6.98            | 5.46          | 6.81              | 7.4       | 57.8           | 22   | 156                       | 30               | 43.7             | 26.3             | Loam            |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 4.18 | 3.11 | 6.67 | 7.0 | 15.3 | 4.64 | 86.0 | 10   | 18.7 | 20   |
| Average | 12.8 | 5.56 | 15.3 | 7.7 | 45.9 | 13.3 | 115  | 28   | 36   | 37   |
| Max     | 21.8 | 7.59 | 33.8 | 8.2 | 80.1 | 23.5 | 156  | 52.5 | 48.7 | 58.8 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12   | 12   | 12   |

Depth to Coal: 45'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |     |      |      |      |
|---------|------|------|------|-----|------|------|-----|------|------|------|
| Min     | 4.18 | 3.11 | 6.67 | 7.7 | 15.3 | 4.64 | 86  | 10   | 18.7 | 20   |
| Average | 14   | 5    | 17   | 8   | 41   | 11   | 106 | 28   | 34   | 38   |
| Max     | 21.8 | 7.17 | 33.8 | 8.2 | 61.6 | 20.8 | 135 | 52.5 | 45   | 58.8 |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9   | 9    | 9    | 9    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-07R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2507.9                         | 5                            | 2502.9                            | 10.3            | 2.86          | 9.1               | 7.6       | 15.6           | 5.01 | 112                       | 27.5             | 31.2             | 41.3             | Clay            |
| 5                         | 2502.9                         | 10                           | 2497.9                            | 24.9            | 7.03          | 29.3              | 7.6       | 48.8           | 9.38 | 94.5                      | 25               | 32.5             | 42.5             | Clay            |
| 10                        | 2497.9                         | 15                           | 2492.9                            | 24.4            | 6.35          | 27.5              | 7.8       | 41             | 8.05 | 113                       | 15               | 35               | 50               | Clay            |
| 15                        | 2492.9                         | 20                           | 2487.9                            | 23.6            | 6.32          | 28.7              | 7.7       | 37.7           | 7.37 | 66.9                      | 7.5              | 71.2             | 21.3             | Silt Loam       |
| 20                        | 2487.9                         | 25                           | 2482.9                            | 22.3            | 5.38          | 26                | 7.7       | 36.5           | 7.43 | 85                        | 7.5              | 57.5             | 35               | Silty Clay Loam |
| 25                        | 2482.9                         | 30                           | 2477.9                            | 20.4            | 7.04          | 29.5              | 6.9       | 52.6           | 10.5 | 88.3                      | 17.5             | 42.5             | 40               | Silty Clay Loam |
| 30                        | 2477.9                         | 35                           | 2472.9                            | 2.55            | 3.04          | 5.3               | 8.4       | 25.8           | 13   | 142                       | 17.5             | 50               | 32.5             | Silty Clay Loam |
| 35                        | 2472.9                         | 40                           | 2467.9                            | 1.16            | 2.44          | 1.87              | 8.5       | 22.7           | 18.5 | 151                       | 20               | 45               | 35               | Silty Clay Loam |
| 40                        | 2467.9                         | 45                           | 2462.9                            | 11              | 5.19          | 12.5              | 7.8       | 43.9           | 12.8 | 105                       | 40               | 30               | 30               | Clay Loam       |
| 65                        | 2442.9                         | 70                           | 2437.9                            | 0.34            | 1.56          | 0.31              | 8.4       | 15.4           | 27   | 157                       | 25               | 42.5             | 32.5             | Clay Loam       |
| 70                        | 2437.9                         | 75                           | 2432.9                            | 0.28            | 1.02          | 0.39              | 8.9       | 9.93           | 17.1 | 136                       | 22.5             | 52.5             | 25               | Silt Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.28 | 1.02 | 0.31 | 6.9 | 9.93 | 5.01 | 66.9 | 7.5 | 30   | 21.3 |
| Average | 12.8 | 4.38 | 15.5 | 7.9 | 31.8 | 12.4 | 114  | 20  | 45   | 35   |
| Max     | 24.9 | 7.04 | 29.5 | 8.9 | 52.6 | 27   | 157  | 40  | 71.2 | 50   |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11  | 11   | 11   |

Depth to Coal: 44'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 1.16 | 2.44 | 1.87 | 6.9 | 15.6 | 5.01 | 66.9 | 7.5 | 30   | 21.3 |
| Average | 15.6 | 5.07 | 18.9 | 7.8 | 36.1 | 10.2 | 106  | 20  | 44   | 36   |
| Max     | 24.9 | 7.04 | 29.5 | 8.5 | 52.6 | 18.5 | 151  | 40  | 71.2 | 50   |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9   | 9    | 9    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.13

OVERBURDEN ANALYSIS DATA FOR SHOB-08R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2583.2                         | 5                            | 2578.2                            | 5.01            | 1.29          | 5.21              | 7.7       | 5.51           | 2.44 | 80.6                      | 11.3             | 47.4             | 41.3             | Silty Clay      |
| 5                         | 2578.2                         | 10                           | 2573.2                            | 17.3            | 5.54          | 24.5              | 7.7       | 33.6           | 7.35 | 126                       | 3.8              | 38.7             | 57.5             | Clay            |
| 10                        | 2573.2                         | 15                           | 2568.2                            | 3.4             | 3.8           | 5.98              | 6.0       | 34.9           | 16.1 | 61.5                      | 21.3             | 43.7             | 35               | Clay Loam       |
| 15                        | 2568.2                         | 20                           | 2563.2                            | 1.95            | 2.5           | 2.25              | 8.5       | 26.4           | 18.3 | 123                       | 10               | 53.7             | 36.3             | Silty Clay Loam |
| 20                        | 2563.2                         | 25                           | 2558.2                            | 1.59            | 2.67          | 2.01              | 8.5       | 24             | 17.9 | 135                       | 5                | 56.2             | 38.8             | Silty Clay Loam |
| 25                        | 2558.2                         | 30                           | 2553.2                            | 1.58            | 3.14          | 2.23              | 8.0       | 30             | 21.7 | 160                       | 7.5              | 32.5             | 60               | Clay            |
| 30                        | 2553.2                         | 35                           | 2548.2                            | 2.8             | 4.88          | 4.05              | 7.1       | 51.2           | 27.7 | 103                       | 22.5             | 45               | 32.5             | Clay Loam       |
| 35                        | 2548.2                         | 40                           | 2543.2                            | 1.64            | 4.09          | 1.99              | 7.8       | 48.5           | 36   | 94.3                      | 21.3             | 53.7             | 25               | Silt Loam       |
| 40                        | 2543.2                         | 45                           | 2538.2                            | 0.68            | 2.78          | 0.76              | 8.8       | 27.4           | 32.3 | 108                       | 3.8              | 61.2             | 35               | Silty Clay Loam |
| 45                        | 2538.2                         | 50                           | 2533.2                            | 0.75            | 3.11          | 0.89              | 8.6       | 30.6           | 33.8 | 80                        | 36.3             | 38.7             | 25               | Loam            |
| 50                        | 2533.2                         | 55                           | 2528.2                            | 0.7             | 2.98          | 0.63              | 8.8       | 31.1           | 38.1 | 126                       | 8.8              | 52.4             | 38.8             | Silty Clay Loam |
| 55                        | 2528.2                         | 60                           | 2523.2                            | 0.52            | 2.91          | 0.52              | 8.9       | 29.8           | 41.5 | 131                       | 18.8             | 57.4             | 23.8             | Silt Loam       |
| 60                        | 2523.2                         | 65                           | 2518.2                            | 0.44            | 2.02          | 0.33              | 9.1       | 19.9           | 32.1 | 123                       | 11.3             | 61.2             | 27.5             | Silty Clay Loam |
| 65                        | 2518.2                         | 70                           | 2513.2                            | 0.35            | 1.87          | 0.28              | 8.8       | 18.2           | 32.5 | 157                       | 8.8              | 51.2             | 40               | Silty Clay Loam |
| 85                        | 2498.2                         | 90                           | 2493.2                            | 0.51            | 2.37          | 0.41              | 7.5       | 26.1           | 38.5 | 104                       | 58.8             | 21.2             | 20               | Sandy Loam      |
| 90                        | 2493.2                         | 95                           | 2488.2                            | 0.47            | 2.61          | 0.43              | 8.7       | 30.8           | 45.9 | 112                       | 11.3             | 62.4             | 26.3             | Silt Loam       |
| 95                        | 2488.2                         | 100                          | 2483.2                            | 0.36            | 1.73          | 0.3               | 9.1       | 18.7           | 32.4 | 124                       | 13.8             | 59.9             | 26.3             | Silt Loam       |
| 100                       | 2483.2                         | 105                          | 2478.2                            | 0.42            | 2.11          | 0.3               | 9.4       | 24.2           | 40.4 | 97.4                      | 51.3             | 36.2             | 12.5             | Loam            |
| 105                       | 2478.2                         | 110                          | 2473.2                            | 0.53            | 3.07          | 0.53              | 9.3       | 35.6           | 49   | 74.5                      | 68.8             | 22.4             | 8.8              | Sandy Loam      |
| 110                       | 2473.2                         | 115                          | 2468.2                            | 0.49            | 2.54          | 0.4               | 9.1       | 29.5           | 44.4 | 86.6                      | 61.3             | 37.4             | 1.3              | Sandy Loam      |
| 115                       | 2468.2                         | 120                          | 2463.2                            | 0.5             | 2.58          | 0.38              | 9.2       | 27.9           | 42.2 | 75.4                      | 60               | 27.5             | 12.5             | Sandy Loam      |
| 120                       | 2463.2                         | 125                          | 2458.2                            | 0.32            | 1.75          | 0.2               | 9.3       | 18             | 35.3 | 112                       | 36.3             | 48.7             | 15               | Loam            |
| 125                       | 2458.2                         | 130                          | 2453.2                            | 0.36            | 1.8           | 0.24              | 9.2       | 17.6           | 32.2 | 129                       | 26.3             | 56.2             | 17.5             | Silt Loam       |
| 130                       | 2453.2                         | 135                          | 2448.2                            | 0.42            | 3.04          | 0.29              | 9.3       | 31.4           | 52.8 | 116                       | 38.8             | 46.2             | 15               | Loam            |
| 135                       | 2448.2                         | 140                          | 2443.2                            | 0.55            | 3.19          | 0.41              | 9.3       | 35.2           | 50.8 | 112                       | 33.8             | 49.9             | 16.3             | Loam            |
| 140                       | 2443.2                         | 145                          | 2438.2                            | 0.21            | 2.36          | 0.29              | 9.2       | 24.7           | 49.6 | 101                       | 41.3             | 43.7             | 15               | Loam            |
| 145                       | 2438.2                         | 150                          | 2433.2                            | 0.6             | 4.29          | 0.61              | 9.2       | 50.5           | 65   | 73                        | 66.3             | 23.7             | 10               | Sandy Loam      |
| 150                       | 2433.2                         | 155                          | 2428.2                            | 0.24            | 2.05          | 0.2               | 9.3       | 22             | 46.8 | 72.7                      | 71.3             | 21.2             | 7.5              | Sandy Loam      |
| 155                       | 2428.2                         | 160                          | 2423.2                            | 0.4             | 2.9           | 0.36              | 9.2       | 33.5           | 54.5 | 75.2                      | 66.3             | 23.7             | 10               | Sandy Loam      |
| 160                       | 2423.2                         | 165                          | 2418.2                            | 0.35            | 1.89          | 0.25              | 9.1       | 20.1           | 36.6 | 128                       | 23.8             | 49.9             | 26.3             | Loam            |
| 165                       | 2418.2                         | 170                          | 2413.2                            | 0.54            | 3.2           | 0.58              | 8.7       | 41             | 54.9 | 64.5                      | 66.3             | 22.4             | 11.3             | Sandy Loam      |
| 170                       | 2413.2                         | 175                          | 2408.2                            | 0.45            | 2.96          | 0.4               | 9.3       | 34.4           | 52.9 | 58.3                      | 75               | 16.2             | 8.8              | Sandy Loam      |
| 175                       | 2408.2                         | 180                          | 2403.2                            | 0.52            | 3.02          | 0.43              | 9.4       | 39.5           | 57.2 | 69.1                      | 71.3             | 18.7             | 10               | Sandy Loam      |
| 180                       | 2403.2                         | 185                          | 2398.2                            |                 |               |                   |           |                |      |                           | 36.3             | 41.2             | 22.5             | Loam            |
| 185                       | 2398.2                         | 190                          | 2393.2                            | 0.38            | 2.36          | 0.35              | 9.3       | 26             | 43   | 54.9                      | 76.3             | 14.9             | 8.8              | Sandy Loam      |
| 190                       | 2393.2                         | 195                          | 2388.2                            | 0.48            | 3.39          | 0.56              | 9.4       | 43.8           | 60.7 | 57.5                      | 75               | 17.5             | 7.5              | Sandy Loam      |
| 195                       | 2388.2                         | 200                          | 2383.2                            | 0.35            | 2.41          | 0.35              | 9.5       | 27.1           | 45.9 | 55.7                      | 76.3             | 16.2             | 7.5              | Sandy Loam      |
| 200                       | 2383.2                         | 205                          | 2378.2                            |                 |               |                   |           |                |      |                           | 76.3             | 16.2             | 7.5              | Sandy Loam      |
| 205                       | 2378.2                         | 210                          | 2373.2                            | 0.6             | 4.6           | 0.9               | 9.7       | 63.5           | 73.4 | 71.5                      | 73.8             | 14.9             | 11.3             | Sandy Loam      |
| 210                       | 2373.2                         | 215                          | 2368.2                            | 0.46            | 2.24          | 0.33              | 8.9       | 29.1           | 46.2 | 126                       | 33.8             | 28.7             | 37.5             | Clay Loam       |
| 215                       | 2368.2                         | 220                          | 2363.2                            | 0.36            | 1.34          | 0.23              | 9.0       | 15.4           | 28.6 | 152                       | 10               | 42.5             | 47.5             | Silty Clay      |
| 220                       | 2363.2                         | 225                          | 2358.2                            | 0.34            | 1.7           | 0.22              | 9.0       | 18             | 34.1 | 154                       | 8.8              | 38.7             | 52.5             | Clay            |
| 225                       | 2358.2                         | 230                          | 2353.2                            | 0.62            | 1.41          | 1.58              | 9.1       | 17.4           | 16.6 | 163                       | 5                | 42.5             | 52.5             | Silty Clay      |
| 230                       | 2353.2                         | 235                          | 2348.2                            | 0.58            | 1.51          | 0.48              | 9.1       | 17.7           | 24.3 | 160                       | 7.5              | 32.5             | 60               | Clay            |
| 235                       | 2348.2                         | 240                          | 2343.2                            | 0.72            | 2.08          | 0.49              | 9.0       | 25.1           | 32.4 | 138                       | 7.5              | 48.7             | 43.8             | Silty Clay      |
| 240                       | 2343.2                         | 245                          | 2338.2                            | 0.27            | 1.43          | 0.23              | 9.0       | 14.9           | 29.8 | 132                       | 7.5              | 50               | 42.5             | Silty Clay      |
| 245                       | 2338.2                         | 250                          | 2333.2                            | 0.33            | 1.34          | 0.29              | 8.2       | 15.9           | 28.6 | 142                       | 22.5             | 35               | 42.5             | Clay            |
| 260                       | 2323.2                         | 265                          | 2318.2                            | 0.4             | 1.54          | 0.34              | 8.9       | 18.5           | 30.6 | 145                       | 12.5             | 45               | 42.5             | Silty Clay      |
| 265                       | 2318.2                         | 270                          | 2313.2                            | 0.38            | 1.51          | 0.31              | 9.2       | 16             | 27.4 | 160                       | 12.5             | 50               | 37.5             | Silty Clay Loam |
| 270                       | 2313.2                         | 275                          | 2308.2                            | 0.24            | 0.95          | 0.2               | 9.4       | 9.67           | 20.6 | 161                       | 16.3             | 53.7             | 30               | Silty Clay Loam |
| 275                       | 2308.2                         | 280                          | 2303.2                            | 0.33            | 1.45          | 0.29              | 9.2       | 15.3           | 27.4 | 148                       | 11.3             | 56.2             | 32.5             | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |     |
|---------|------|------|------|-----|------|------|------|------|------|-----|
| Min     | 0.21 | 0.95 | 0.2  | 6.0 | 5.51 | 2.44 | 54.9 | 3.8  | 14.9 | 1.3 |
| Average | 1.10 | 2.54 | 1.3  | 8.8 | 27.5 | 36.9 | 110  | 33   | 40   | 27  |
| Max     | 17.3 | 5.54 | 24.5 | 9.7 | 63.5 | 73.4 | 163  | 76.3 | 62.4 | 60  |
| Number  | 49   | 49   | 49   | 49  | 49   | 49   | 49   | 51   | 51   | 51  |

Depth to Coal: 70'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.35 | 1.29 | 0.28 | 6.0 | 5.51 | 2.44 | 61.5 | 3.8  | 32.5 | 23.8 |
| Average | 2.77 | 3.11 | 3.7  | 8.2 | 29.4 | 25.6 | 115  | 14   | 50   | 37   |
| Max     | 17.3 | 5.54 | 24.5 | 9.1 | 51.2 | 41.5 | 160  | 36.3 | 61.2 | 60   |
| Number  | 14   | 14   | 14   | 14  | 14   | 14   | 14   | 14   | 14   | 14   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.14

OVERBURDEN ANALYSIS DATA FOR SHOB-09R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2575.1                         | 5                            | 2570.1                            | 21.7            | 4.26          | 24                | 7.8       | 16.1           | 3.37 | 111                       | 15               | 30               | 55               | Clay            |
| 5                         | 2570.1                         | 10                           | 2565.1                            | 22.5            | 7.37          | 40.7              | 5.7       | 48             | 8.54 | 128                       | 2.5              | 40               | 57.5             | Silty Clay      |
| 10                        | 2565.1                         | 15                           | 2560.1                            | 22.1            | 12.3          | 66.7              | 3.4       | 93.5           | 14   | 101                       | 75               | 12.5             | 12.5             | Sandy Loam      |
| 15                        | 2560.1                         | 20                           | 2555.1                            | 6.15            | 5.6           | 17.4              | 5.8       | 40.5           | 11.8 | 106                       | 10               | 37.5             | 52.5             | Clay            |
| 20                        | 2555.1                         | 25                           | 2550.1                            | 3.76            | 4.02          | 7.87              | 6.4       | 33.4           | 13.8 | 128                       | 5                | 32.5             | 62.5             | Clay            |
| 25                        | 2550.1                         | 30                           | 2545.1                            | 4.41            | 5.3           | 6.63              | 6.5       | 50.1           | 21.3 | 106                       | 40               | 22.5             | 37.5             | Clay Loam       |
| 30                        | 2545.1                         | 35                           | 2540.1                            | 0.89            | 2.2           | 1.08              | 8.5       | 21.6           | 21.7 | 117                       | 5                | 62.5             | 32.5             | Silty Clay Loam |
| 35                        | 2540.1                         | 40                           | 2535.1                            | 1.07            | 2.98          | 1.46              | 8.7       | 28.7           | 25.5 | 119                       | 5                | 50               | 45               | Silty Clay      |
| 40                        | 2535.1                         | 45                           | 2530.1                            | 0.59            | 2.33          | 0.61              | 8.7       | 21.8           | 28.1 | 134                       | 8.8              | 58.7             | 32.5             | Silty Clay Loam |
| 45                        | 2530.1                         | 50                           | 2525.1                            | 0.48            | 2.49          | 0.49              | 8.8       | 22.7           | 32.5 | 153                       | 5                | 52.5             | 42.5             | Silty Clay      |
| 50                        | 2525.1                         | 55                           | 2520.1                            | 0.97            | 2.22          | 1.25              | 9.1       | 57.5           | 54.6 | 142                       | 17.5             | 55               | 27.5             | Silty Clay Loam |
| 55                        | 2520.1                         | 60                           | 2515.1                            | 0.51            | 2.82          | 0.62              | 9.2       | 28.4           | 37.8 | 120                       | 37.5             | 37.5             | 25               | Loam            |
| 60                        | 2515.1                         | 65                           | 2510.1                            | 0.84            | 4.61          | 1.07              | 9.0       | 53.8           | 55.1 | 87                        | 65               | 17.5             | 17.5             | Sandy Loam      |
| 65                        | 2510.1                         | 70                           | 2505.1                            | 0.59            | 4.08          | 0.68              | 9.2       | 42.5           | 53.4 | 54.9                      | 80               | 5                | 15               | Sandy Loam      |
| 70                        | 2505.1                         | 75                           | 2500.1                            | 0.82            | 5.09          | 0.91              | 9.2       | 53.7           | 57.8 | 66                        | 77.5             | 7.5              | 15               | Sandy Loam      |
| 75                        | 2500.1                         | 80                           | 2495.1                            | 2.16            | 7.65          | 2.3               | 7.6       | 97             | 65   | 68.2                      | 70               | 17.5             | 12.5             | Sandy Loam      |
| 95                        | 2480.1                         | 100                          | 2475.1                            | 0.36            | 2.73          | 0.35              | 8.1       | 28.9           | 48.5 | 140                       | 15               | 52.5             | 32.5             | Silty Clay Loam |
| 100                       | 2475.1                         | 105                          | 2470.1                            | 0.43            | 2.2           | 0.35              | 8.5       | 22.8           | 36.5 | 118                       | 11.3             | 52.4             | 36.3             | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.36 | 2.2  | 0.35 | 3.4 | 16.1 | 3.37 | 54.9 | 2.5 | 5    | 12.5 |
| Average | 5.02 | 4.46 | 9.7  | 7.8 | 42.3 | 32.7 | 111  | 30  | 36   | 34   |
| Max     | 22.5 | 12.3 | 66.7 | 9.2 | 97   | 65   | 153  | 80  | 62.5 | 62.5 |
| Number  | 18   | 18   | 18   | 18  | 18   | 18   | 18   | 18  | 18   | 18   |

Depth to Coal: 77'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.48 | 2.2  | 0.49 | 3.4 | 16.1 | 3.37 | 54.9 | 2.5 | 5    | 12.5 |
| Average | 5.60 | 4.71 | 10.9 | 7.7 | 44.3 | 31.5 | 109  | 32  | 34   | 34   |
| Max     | 22.5 | 12.3 | 66.7 | 9.2 | 97   | 65   | 153  | 80  | 62.5 | 62.5 |
| Number  | 16   | 16   | 16   | 16  | 16   | 16   | 16   | 16  | 16   | 16   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.15

OVERBURDEN ANALYSIS DATA FOR SHOB-10R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2515.6                         | 5                            | 2510.6                            | 24.2            | 5.29          | 42.6              | 7.2       | 15.2           | 2.62 | 60.5                      | 30               | 36.2             | 33.8             | Clay Loam       |
| 5                         | 2510.6                         | 10                           | 2505.6                            | 21.5            | 7.18          | 49                | 7.7       | 38.6           | 6.51 | 60.8                      | 15               | 60               | 25               | Silt Loam       |
| 10                        | 2505.6                         | 15                           | 2500.6                            | 20.8            | 6.52          | 38.6              | 7.8       | 35.1           | 6.43 | 51.1                      | 22.5             | 61.2             | 16.3             | Silt Loam       |
| 15                        | 2500.6                         | 20                           | 2495.6                            | 19.7            | 5.96          | 26.4              | 7.5       | 35.8           | 7.46 | 71.4                      | 20               | 52.5             | 27.5             | Clay Loam       |
| 20                        | 2495.6                         | 25                           | 2490.6                            | 16.1            | 5.7           | 19.4              | 7.6       | 37.3           | 8.85 | 68.5                      | 22.5             | 50               | 27.5             | Clay Loam       |
| 25                        | 2490.6                         | 30                           | 2485.6                            | 7.49            | 5.24          | 8.45              | 7.7       | 46.1           | 16.3 | 87.4                      | 15               | 61.2             | 23.8             | Silt Loam       |
| 30                        | 2485.6                         | 35                           | 2480.6                            | 2.32            | 3.4           | 3.04              | 8.1       | 31.4           | 19.2 | 141                       | 16.3             | 46.2             | 37.5             | Silty Clay Loam |
| 35                        | 2480.6                         | 40                           | 2475.6                            | 0.83            | 2.58          | 0.99              | 8.7       | 23.4           | 24.5 | 165                       | 6.3              | 54.9             | 38.8             | Silty Clay Loam |
| 40                        | 2475.6                         | 45                           | 2470.6                            | 0.7             | 2.55          | 0.71              | 8.7       | 23.6           | 28   | 132                       | 13.8             | 56.2             | 30               | Silty Clay Loam |
| 45                        | 2470.6                         | 50                           | 2465.6                            | 0.68            | 2.63          | 0.6               | 9.0       | 24.8           | 31   | 76.2                      | 60               | 22.5             | 17.5             | Sandy Loam      |
| 50                        | 2465.6                         | 55                           | 2460.6                            | 0.4             | 1.62          | 0.3               | 9.0       | 13.8           | 23.2 | 91.9                      | 52.5             | 27.5             | 20               | Sandy Loam      |
| 55                        | 2460.6                         | 60                           | 2455.6                            | 1.22            | 3             | 1.3               | 8.8       | 27.4           | 24.4 | 82.9                      | 62.5             | 20               | 17.5             | Sandy Loam      |
| 80                        | 2435.6                         | 85                           | 2430.6                            | 0.3             | 2.38          | 0.25              | 8.6       | 14.8           | 28.1 | 173                       | 12.5             | 35               | 52.5             | Clay            |
| 85                        | 2430.6                         | 90                           | 2425.6                            | 0.57            | 2.43          | 0.43              | 9.1       | 21.4           | 30.4 | 161                       | 12.5             | 52.5             | 35               | Silty Clay Loam |
| 90                        | 2425.6                         | 95                           | 2420.6                            | 0.36            | 1.92          | 0.3               | 9.3       | 19.6           | 34.4 | 153                       | 10               | 57.5             | 32.5             | Silty Clay Loam |
| 95                        | 2420.6                         | 100                          | 2415.6                            | 1.04            | 3.96          | 0.89              | 9.4       | 56.8           | 57.9 | 144                       | 18.8             | 56.2             | 25               | Silt Loam       |
| 100                       | 2415.6                         | 105                          | 2410.6                            | 0.48            | 2.4           | 0.31              | 9.4       | 24.4           | 38.8 | 143                       | 17.5             | 58.7             | 23.8             | Silt Loam       |
| 105                       | 2410.6                         | 110                          | 2405.6                            | 0.59            | 3.27          | 0.52              | 9.6       | 34.6           | 46.6 | 126                       | 20               | 60               | 20               | Silt Loam       |
| 110                       | 2405.6                         | 115                          | 2400.6                            | 0.43            | 2.8           | 0.43              | 9.3       | 27.5           | 42.1 | 138                       | 22.5             | 56.2             | 21.3             | Silt Loam       |
| 115                       | 2400.6                         | 120                          | 2395.6                            | 0.45            | 2.45          | 0.3               | 9.2       | 25.6           | 41.8 | 155                       | 10               | 52.5             | 37.5             | Silty Clay Loam |
| 120                       | 2395.6                         | 125                          | 2390.6                            | 0.26            | 1.67          | 0.2               | 9.4       | 16.2           | 33.8 | 148                       | 11.3             | 53.7             | 35               | Silty Clay Loam |
| 125                       | 2390.6                         | 130                          | 2385.6                            | 0.44            | 2.69          | 0.35              | 9.5       | 33.5           | 53.6 | 151                       | 12.5             | 61.2             | 26.3             | Silt Loam       |
| 130                       | 2385.6                         | 135                          | 2380.6                            | 0.84            | 4.68          | 0.81              | 8.6       | 61.4           | 67.6 | 154                       | 10               | 50               | 40               | Silty Clay      |
| 135                       | 2380.6                         | 140                          | 2375.6                            | 0.47            | 2.92          | 0.34              | 9.0       | 31.1           | 48.7 | 132                       | 17.5             | 56.2             | 26.3             | Silt Loam       |
| 140                       | 2375.6                         | 145                          | 2370.6                            | 0.34            | 2.13          | 0.27              | 8.8       | 21.4           | 38.8 | 120                       | 37.5             | 40               | 22.5             | Loam            |
| 145                       | 2370.6                         | 150                          | 2365.6                            | 0.31            | 2.16          | 0.29              | 9.0       | 22.2           | 40.4 | 102                       | 35               | 47.5             | 17.5             | Loam            |
| 150                       | 2365.6                         | 155                          | 2360.6                            | 0.39            | 3.02          | 0.45              | 8.9       | 30.6           | 47.4 | 101                       | 50               | 35               | 15               | Loam            |
| 155                       | 2360.6                         | 160                          | 2355.6                            | 0.3             | 2.61          | 0.34              | 9.0       | 26.3           | 46.6 | 72.2                      | 60               | 23.7             | 16.3             | Sandy Loam      |
| 160                       | 2355.6                         | 165                          | 2350.6                            | 1.11            | 4.59          | 1.29              | 8.4       | 50.7           | 46.2 | 48.8                      | 67.5             | 23.7             | 8.8              | Sandy Loam      |
| 165                       | 2350.6                         | 170                          | 2345.6                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 170                       | 2345.6                         | 175                          | 2340.6                            | 0.46            | 1.79          | 0.29              | 9.4       | 17.6           | 28.7 | 106                       | 65               | 17.5             | 17.5             | Sandy Loam      |
| 175                       | 2340.6                         | 180                          | 2335.6                            | 0.31            | 1.25          | 0.18              | 9.6       | 12.2           | 24.5 | 131                       | 65               | 16.2             | 18.8             | Sandy Loam      |
| 180                       | 2335.6                         | 185                          | 2330.6                            | 0.38            | 1.56          | 0.22              | 9.0       | 15.2           | 40.4 | 136                       | 17.5             | 31.2             | 51.3             | Clay            |
| 185                       | 2330.6                         | 190                          | 2325.6                            | 0.27            | 1.72          | 0.22              | 9.1       | 17             | 34.2 | 107                       | 10               | 58.7             | 31.3             | Silty Clay Loam |
| 190                       | 2325.6                         | 195                          | 2320.6                            | 0.47            | 2.01          | 0.32              | 8.9       | 23.1           | 36.8 | 105                       | 6.3              | 54.9             | 38.8             | Silty Clay Loam |
| 195                       | 2320.6                         | 200                          | 2315.6                            | 0.46            | 2.36          | 0.34              | 9.2       | 25.6           | 40.4 | 112                       | 5                | 48.7             | 46.3             | Silty Clay      |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.26 | 1.25 | 0.18 | 7.2 | 12.2 | 2.62 | 48.8 | 5    | 16.2 | 8.8  |
| Average | 3.63 | 3.16 | 5.7  | 8.8 | 28.0 | 32.8 | 115  | 27   | 46   | 28   |
| Max     | 24.2 | 7.18 | 49   | 9.6 | 61.4 | 67.6 | 173  | 67.5 | 61.2 | 52.5 |
| Number  | 35   | 35   | 35   | 35  | 35   | 35   | 35   | 35   | 35   | 35   |

Depth to Coal: 63'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.40 | 1.62 | 0.3  | 7.2 | 13.8 | 2.62 | 51.1 | 6.3  | 20   | 16.3 |
| Average | 9.66 | 4.31 | 15.9 | 8.2 | 29.4 | 16.5 | 90.7 | 28   | 46   | 26   |
| Max     | 24.2 | 7.18 | 49   | 9.0 | 46.1 | 31   | 165  | 62.5 | 61.2 | 38.8 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12   | 12   | 12   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.16

OVERBURDEN ANALYSIS DATA FOR SHOB-11R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2567.3                         | 5                            | 2562.3                            | 18.9            | 7.33          | 27.8              | 8.1       | 61.1           | 12.7 | 107                       | 7.5              | 42.5             | 50               | Silty Clay      |
| 5                         | 2562.3                         | 10                           | 2557.3                            | 22              | 11.2          | 44                | 8.2       | 98.1           | 17.1 | 102                       | 10               | 40               | 50               | Silty Clay      |
| 10                        | 2557.3                         | 15                           | 2552.3                            | 19.3            | 11.5          | 43.9              | 8.1       | 115            | 20.5 | 109                       | 12.5             | 37.5             | 50               | Clay            |
| 15                        | 2552.3                         | 20                           | 2547.3                            | 21              | 11.2          | 38.3              | 6.4       | 115            | 21.1 | 107                       | 15               | 27.5             | 57.5             | Clay            |
| 20                        | 2547.3                         | 25                           | 2542.3                            | 19              | 11.1          | 40                | 7.7       | 103            | 18.9 | 73.4                      | 25               | 42.5             | 32.5             | Clay Loam       |
| 25                        | 2542.3                         | 30                           | 2537.3                            | 19.5            | 10.8          | 36                | 8.0       | 102            | 19.3 | 51.6                      | 42.5             | 37.5             | 20               | Loam            |
| 30                        | 2537.3                         | 35                           | 2532.3                            | 10.7            | 7.26          | 17                | 7.5       | 70.3           | 18.9 | 98.6                      | 12.5             | 37.5             | 50               | Clay            |
| 35                        | 2532.3                         | 40                           | 2527.3                            | 7.32            | 6.53          | 11.7              | 8.1       | 62.9           | 20.4 | 108                       | 7.5              | 50               | 42.5             | Silty Clay      |
| 40                        | 2527.3                         | 45                           | 2522.3                            | 1.79            | 3.53          | 2.58              | 8.4       | 33.8           | 22.8 | 171                       | 5                | 55               | 40               | Silty Clay Loam |
| 45                        | 2522.3                         | 50                           | 2517.3                            | 1.55            | 4.35          | 2.14              | 8.7       | 45.4           | 33.4 | 179                       | 7.5              | 60               | 32.5             | Silty Clay Loam |
| 50                        | 2517.3                         | 55                           | 2512.3                            | 0.52            | 2.56          | 0.61              | 9.0       | 24.7           | 33   | 186                       | 10               | 42.5             | 47.5             | Silty Clay      |
| 55                        | 2512.3                         | 60                           | 2507.3                            | 0.74            | 3.67          | 1.13              | 9.0       | 39.5           | 40.8 | 159                       | 12.5             | 50               | 37.5             | Silty Clay Loam |
| 60                        | 2507.3                         | 65                           | 2502.3                            | 5.5             | 9.24          | 7.59              | 7.1       | 103            | 40.2 | 97.9                      | 51.3             | 21.2             | 27.5             | Sandy Clay Loam |
| 80                        | 2487.3                         | 85                           | 2482.3                            | 1.16            | 4.12          | 1.66              | 8.3       | 42.6           | 35.9 | 137                       | 20               | 47.5             | 32.5             | Silty Clay Loam |
| 85                        | 2482.3                         | 90                           | 2477.3                            | 0.5             | 3.33          | 0.73              | 8.9       | 34.7           | 44.1 | 152                       | 10               | 52.5             | 37.5             | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.5  | 2.56 | 0.61 | 6.4 | 24.7 | 12.7 | 51.6 | 5    | 21.2 | 20   |
| Average | 10.0 | 7.18 | 18.3 | 8.1 | 70.1 | 26.6 | 123  | 17   | 43   | 41   |
| Max     | 22   | 11.5 | 44   | 9.0 | 115  | 44.1 | 186  | 51.3 | 60   | 57.5 |
| Number  | 15   | 15   | 15   | 15  | 15   | 15   | 15   | 15   | 15   | 15   |

Depth to Coal: 62'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.52 | 2.56 | 0.61 | 6.4 | 24.7 | 12.7 | 51.6 | 5    | 21.2 | 20   |
| Average | 11.4 | 7.71 | 21.0 | 8.0 | 74.9 | 24.5 | 119  | 17   | 42   | 41   |
| Max     | 22   | 11.5 | 44   | 9.0 | 115  | 40.8 | 186  | 51.3 | 60   | 57.5 |
| Number  | 13   | 13   | 13   | 13  | 13   | 13   | 13   | 13   | 13   | 13   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



OVERBURDEN ANALYSIS DATA FOR SHOB-12R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2573.1                         | 5                            | 2568.1                            | 22.7            | 7.78          | 66.6              | 8.3       | 44.2           | 6.62 | 90.5                      | 20               | 30               | 50               | Clay            |
| 5                         | 2568.1                         | 10                           | 2563.1                            | 22.2            | 7.38          | 53.4              | 4.3       | 46.8           | 7.62 | 63.1                      | 30               | 52.5             | 17.5             | Silt Loam       |
| 10                        | 2563.1                         | 15                           | 2558.1                            | 8.73            | 4.28          | 12.6              | 4.8       | 35.2           | 10.8 | 50.4                      | 73.8             | 6.2              | 20               | Sandy Clay Loam |
| 15                        | 2558.1                         | 20                           | 2553.1                            | 7.77            | 3.73          | 10.8              | 6.2       | 31.5           | 10.4 | 90.9                      | 12.5             | 35               | 52.5             | Clay            |
| 20                        | 2553.1                         | 25                           | 2548.1                            | 0.96            | 1.38          | 1.61              | 8.9       | 12.4           | 10.9 | 141                       | 12.5             | 42.5             | 45               | Silty Clay      |
| 25                        | 2548.1                         | 30                           | 2543.1                            | 0.99            | 1.28          | 0.86              | 8.4       | 11.2           | 11.6 | 159                       | 7.5              | 50               | 42.5             | Silty Clay      |
| 30                        | 2543.1                         | 35                           | 2538.1                            | 0.89            | 1.13          | 0.86              | 8.6       | 10.1           | 10.7 | 160                       | 3.8              | 48.7             | 47.5             | Silty Clay      |
| 35                        | 2538.1                         | 40                           | 2533.1                            | 2.38            | 1.94          | 3.24              | 7.1       | 18.4           | 11   | 101                       | 45               | 13.7             | 41.3             | Sandy Clay      |
| 40                        | 2533.1                         | 45                           | 2528.1                            | 1.03            | 1.4           | 1.14              | 8.4       | 14.2           | 13.6 | 107                       | 5                | 41.2             | 53.8             | Silty Clay      |
| 45                        | 2528.1                         | 50                           | 2523.1                            | 0.47            | 1.21          | 0.39              | 8.9       | 12             | 18.2 | 116                       | 17.5             | 47.5             | 35               | Silty Clay Loam |
| 50                        | 2523.1                         | 55                           | 2518.1                            | 0.72            | 1.46          | 0.57              | 9.3       | 16.5           | 20.5 | 118                       | 17.5             | 52.5             | 30               | Silty Clay Loam |
| 55                        | 2518.1                         | 60                           | 2513.1                            | 0.54            | 1.58          | 0.54              | 9.0       | 17             | 23.1 | 125                       | 2.5              | 63.7             | 33.8             | Silty Clay Loam |
| 60                        | 2513.1                         | 65                           | 2508.1                            | 0.76            | 1.71          | 0.53              | 9.3       | 17.2           | 21.4 | 122                       | 15               | 57.5             | 27.5             | Silty Clay Loam |
| 65                        | 2508.1                         | 70                           | 2503.1                            | 0.29            | 1.43          | 0.35              | 9.6       | 14.2           | 25   | 119                       | 32.5             | 45               | 22.5             | Loam            |
| 70                        | 2503.1                         | 75                           | 2498.1                            | 0.37            | 1.71          | 0.32              | 9.2       | 18.3           | 31.2 | 167                       | 3.8              | 36.2             | 60               | Clay            |
| 75                        | 2498.1                         | 80                           | 2493.1                            | 0.41            | 1.82          | 0.35              | 9.0       | 19.1           | 31.1 | 138                       | 7.5              | 51.2             | 41.3             | Silty Clay      |
| 100                       | 2473.1                         | 105                          | 2468.1                            | 0.45            | 2.75          | 0.42              | 9.0       | 28.6           | 43.3 | 85.1                      | 62.5             | 21.2             | 16.3             | Sandy Loam      |
| 105                       | 2468.1                         | 110                          | 2463.1                            | 0.85            | 3.6           | 0.98              | 9.3       | 40.4           | 42.3 | 73.4                      | 67.5             | 20               | 12.5             | Sandy Loam      |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.29 | 1.13 | 0.32 | 4.3 | 10.1 | 6.62 | 50.4 | 2.5  | 6.2  | 12.5 |
| Average | 4.03 | 2.64 | 8.6  | 8.2 | 22.6 | 19.4 | 113  | 24   | 40   | 36   |
| Max     | 22.7 | 7.78 | 66.6 | 9.6 | 46.8 | 43.3 | 167  | 73.8 | 63.7 | 60   |
| Number  | 18   | 18   | 18   | 18  | 18   | 18   | 18   | 18   | 18   | 18   |

Depth to Coal: 78'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.29 | 1.13 | 0.32 | 4.3 | 10.1 | 6.62 | 50.4 | 2.5  | 6.2  | 17.5 |
| Average | 4.45 | 2.58 | 9.6  | 8.1 | 21.1 | 16.5 | 117  | 19   | 42   | 39   |
| Max     | 22.7 | 7.78 | 66.6 | 9.6 | 46.8 | 31.2 | 167  | 73.8 | 63.7 | 60   |
| Number  | 16   | 16   | 16   | 16  | 16   | 16   | 16   | 16   | 16   | 16   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.18

OVERBURDEN ANALYSIS DATA FOR SHOB-13R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2535.6                         | 5                            | 2530.6                            | 1.15            | 1.34          | 1.53              | 8.2       | 11.8           | 10.2 | 93.2                      | 15               | 43.7             | 41.3             | Silty Clay      |
| 5                         | 2530.6                         | 10                           | 2525.6                            | 22.1            | 6.11          | 23.4              | 7.7       | 40.6           | 8.51 | 79.3                      | 7.5              | 53.7             | 38.8             | Silty Clay Loam |
| 10                        | 2525.6                         | 15                           | 2520.6                            | 4.82            | 3.42          | 6.26              | 8.0       | 27.8           | 11.8 | 90.2                      | 45               | 31.2             | 23.8             | Loam            |
| 15                        | 2520.6                         | 20                           | 2515.6                            | 4.6             | 4             | 6.42              | 8.0       | 35.9           | 15.3 | 75.7                      | 55               | 23.7             | 21.3             | Sandy Clay Loam |
| 20                        | 2515.6                         | 25                           | 2510.6                            | 11.7            | 6.51          | 15.4              | 7.8       | 56.4           | 15.3 | 54.1                      | 63.8             | 17.4             | 18.8             | Sandy Loam      |
| 25                        | 2510.6                         | 30                           | 2505.6                            | 19.9            | 7.68          | 22.7              | 7.8       | 63             | 13.7 | 111                       | 55               | 21.2             | 23.8             | Sandy Clay Loam |
| 30                        | 2505.6                         | 35                           | 2500.6                            | 5.43            | 5.14          | 10.1              | 6.8       | 46.2           | 16.6 | 137                       | 32.5             | 41.2             | 26.3             | Loam            |
| 45                        | 2490.6                         | 50                           | 2485.6                            | 0.55            | 2.48          | 0.58              | 7.2       | 25.9           | 34.4 | 104                       | 72.5             | 13.7             | 13.8             | Sandy Loam      |
| 50                        | 2485.6                         | 55                           | 2480.6                            | 0.4             | 1.27          | 0.29              | 8.9       | 13.9           | 23.6 | 114                       | 13.8             | 57.4             | 28.8             | Silty Clay Loam |
| 55                        | 2480.6                         | 60                           | 2475.6                            | 0.37            | 1.78          | 0.29              | 9.2       | 17.8           | 30.9 | 135                       | 15               | 58.7             | 26.3             | Silt Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.37 | 1.27 | 0.29 | 6.8 | 11.8 | 8.51 | 54.1 | 7.5  | 13.7 | 13.8 |
| Average | 7.10 | 3.97 | 8.7  | 8.0 | 33.9 | 18.0 | 99.4 | 38   | 36   | 26   |
| Max     | 22.1 | 7.68 | 23.4 | 9.2 | 63   | 34.4 | 137  | 72.5 | 58.7 | 41.3 |
| Number  | 10   | 10   | 10   | 10  | 10   | 10   | 10   | 10   | 10   | 10   |

Depth to Coal: 33'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 1.15 | 1.34 | 1.53 | 6.8 | 11.8 | 8.51 | 54.1 | 7.5  | 17.4 | 18.8 |
| Average | 10.0 | 4.89 | 12.3 | 7.8 | 40.2 | 13.1 | 91.5 | 39   | 33   | 28   |
| Max     | 22.1 | 7.68 | 23.4 | 8.2 | 63   | 16.6 | 137  | 63.8 | 53.7 | 41.3 |
| Number  | 7    | 7    | 7    | 7   | 7    | 7    | 7    | 7    | 7    | 7    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-14R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2545.8                         | 5                            | 2540.8                            | 22.1            | 3.25          | 23.3              | 7.4       | 2.31           | 0.49 | 90.8                      | 20               | 27.5             | 52.5             | Clay            |
| 5                         | 2540.8                         | 10                           | 2535.8                            | 23.6            | 6.43          | 45.3              | 4.1       | 25.7           | 4.37 | 68.9                      | 17.5             | 32.5             | 50               | Clay            |
| 10                        | 2535.8                         | 15                           | 2530.8                            | 22.4            | 5.65          | 50.9              | 5.4       | 25.1           | 4.15 | 69.2                      | 25               | 43.7             | 31.3             | Clay Loam       |
| 15                        | 2530.8                         | 20                           | 2525.8                            | 6.49            | 2.59          | 9.6               | 7.5       | 11.5           | 4.06 | 86.4                      | 12.5             | 56.2             | 31.3             | Silty Clay Loam |
| 20                        | 2525.8                         | 25                           | 2520.8                            | 12.4            | 3.47          | 14.4              | 7.3       | 16.6           | 4.53 | 68.2                      | 27.5             | 46.2             | 26.3             | Loam            |
| 25                        | 2520.8                         | 30                           | 2515.8                            | 1.48            | 1.62          | 2.08              | 8.2       | 12.6           | 9.42 | 111                       | 13.8             | 61.2             | 25               | Silt Loam       |
| 30                        | 2515.8                         | 35                           | 2510.8                            | 2.88            | 2.6           | 3.91              | 8.2       | 21.4           | 11.6 | 62.3                      | 55               | 30               | 15               | Sandy Loam      |
| 35                        | 2510.8                         | 40                           | 2505.8                            | 1.49            | 2.24          | 1.74              | 8.5       | 18.6           | 14.6 | 54.4                      | 60               | 27.5             | 12.5             | Sandy Loam      |
| 40                        | 2505.8                         | 45                           | 2500.8                            | 0.83            | 2.21          | 0.88              | 8.5       | 18.8           | 20.3 | 69.9                      | 60               | 23.7             | 16.3             | Sandy Loam      |
| 45                        | 2500.8                         | 50                           | 2495.8                            |                 | 2.2           |                   | 8.6       |                |      | 76.4                      | 37.5             | 45               | 17.5             | Loam            |
| 50                        | 2495.8                         | 55                           | 2490.8                            | 0.46            | 1.82          | 0.41              | 8.7       | 14.6           | 22.3 | 80.7                      | 47.5             | 35               | 17.5             | Loam            |
| 55                        | 2490.8                         | 60                           | 2485.8                            | 0.48            | 1.87          | 0.39              | 8.8       | 17.7           | 26.9 | 80.9                      | 60               | 22.5             | 17.5             | Sandy Loam      |
| 60                        | 2485.8                         | 65                           | 2480.8                            | 0.67            | 1.98          | 0.54              | 8.9       | 25.7           | 33.1 | 91.2                      | 57.5             | 25               | 17.5             | Sandy Loam      |
| 65                        | 2480.8                         | 70                           | 2475.8                            | 0.79            | 2.59          | 0.73              | 7.5       | 30.6           | 35   | 94.6                      | 57.5             | 22.5             | 20               | Sandy Loam      |
| 70                        | 2475.8                         | 75                           | 2470.8                            | 1.1             | 3.52          | 1.28              | 7.2       | 37.8           | 34.6 | 91.9                      | 77.5             | 17.5             | 5                | Loamy Sand      |
| 75                        | 2470.8                         | 80                           | 2465.8                            | 1.38            | 3.7           | 1.89              | 7.3       | 40.3           | 31.5 | 78.9                      | 77.5             | 15               | 7.5              | Loamy Sand      |
| 80                        | 2465.8                         | 85                           | 2460.8                            | 1.77            | 5.43          | 2.08              | 7.2       | 59.7           | 43   | 83.9                      | 81.3             | 11.2             | 7.5              | Loamy Sand      |
| 85                        | 2460.8                         | 90                           | 2455.8                            | 0.4             | 1.54          | 0.3               | 8.8       | 18.4           | 31.2 | 153                       | 8.8              | 58.7             | 32.5             | Silty Clay Loam |
| 90                        | 2455.8                         | 95                           | 2450.8                            | 0.33            | 1.71          | 0.23              | 8.9       | 15.6           | 29.6 | 174                       | 5                | 47.5             | 47.5             | Silty Clay      |
| 95                        | 2450.8                         | 100                          | 2445.8                            | 0.63            | 2.28          | 0.53              | 9.3       | 28.7           | 37.7 | 174                       | 8.8              | 61.2             | 30               | Silty Clay Loam |
| 100                       | 2445.8                         | 105                          | 2440.8                            | 0.36            | 2.66          | 0.31              | 9.0       | 26.4           | 45.7 | 195                       | 10               | 57.5             | 32.5             | Silty Clay Loam |
| 105                       | 2440.8                         | 110                          | 2435.8                            | 0.27            | 1.22          | 0.15              | 9.6       | 12             | 26.3 | 268                       | 26.3             | 36.2             | 37.5             | Clay Loam       |
| 110                       | 2435.8                         | 115                          | 2430.8                            | 0.17            | 1.36          | 0.1               | 9.6       | 13.8           | 38   | 240                       | 16.3             | 36.2             | 47.5             | Clay            |
| 115                       | 2430.8                         | 120                          | 2425.8                            | 0.22            | 1.88          | 0.19              | 9.2       | 19.7           | 43.1 | 195                       | 7.5              | 30               | 62.5             | Clay            |
| 120                       | 2425.8                         | 125                          | 2420.8                            | 0.32            | 2.52          | 0.3               | 9.4       | 26.4           | 47.4 | 215                       | 6.3              | 36.2             | 57.5             | Clay            |
| 125                       | 2420.8                         | 130                          | 2415.8                            | 0.51            | 2.8           | 0.41              | 8.8       | 32             | 47.1 | 154                       | 20               | 40               | 40               | Silty Clay Loam |
| 130                       | 2415.8                         | 135                          | 2410.8                            | 0.25            | 1.57          | 0.16              | 9.1       | 16.2           | 35.9 | 152                       | 6.3              | 48.7             | 45               | Silty Clay      |
| 135                       | 2410.8                         | 140                          | 2405.8                            | 0.28            | 1.48          | 0.18              | 8.8       | 15.3           | 31.8 | 162                       | 6.3              | 53.7             | 40               | Silty Clay Loam |
| 140                       | 2405.8                         | 145                          | 2400.8                            | 0.62            | 2.83          | 0.66              | 8.7       | 36.4           | 45.4 | 172                       | 3.8              | 52.4             | 43.8             | Silty Clay      |
| 145                       | 2400.8                         | 150                          | 2395.8                            | 0.33            | 1.72          | 0.21              | 9.1       | 19.1           | 36.6 | 158                       | 7.5              | 60               | 32.5             | Silty Clay Loam |
| 150                       | 2395.8                         | 155                          | 2390.8                            | 0.28            | 1.48          | 0.17              | 9.0       | 15.5           | 32.7 | 131                       | 11.3             | 58.7             | 30               | Silty Clay Loam |
| 155                       | 2390.8                         | 160                          | 2385.8                            | 0.25            | 1.16          | 0.15              | 9.0       | 11.7           | 26.1 | 131                       | 5                | 62.5             | 32.5             | Silty Clay Loam |
| 160                       | 2385.8                         | 165                          | 2380.8                            | 0.67            | 3.72          | 0.56              | 9.1       | 42.8           | 54.5 | 142                       | 1.3              | 61.2             | 37.5             | Silty Clay Loam |
| 165                       | 2380.8                         | 170                          | 2375.8                            | 0.7             | 2.91          | 0.5               | 8.9       | 39.1           | 50.4 | 132                       | 3.8              | 56.2             | 40               | Silty Clay Loam |
| 170                       | 2375.8                         | 175                          | 2370.8                            | 0.71            | 3.31          | 0.67              | 9.2       | 39.9           | 48.1 | 134                       | 8.8              | 53.7             | 37.5             | Silty Clay Loam |
| 175                       | 2370.8                         | 180                          | 2365.8                            | 0.36            | 1.88          | 0.25              | 9.2       | 19.8           | 36   | 143                       | 3.8              | 59.9             | 36.3             | Silty Clay Loam |
| 180                       | 2365.8                         | 185                          | 2360.8                            | 0.34            | 1.73          | 0.22              | 9.0       | 17.3           | 32.6 | 142                       | 17.5             | 50               | 32.5             | Silty Clay Loam |
| 185                       | 2360.8                         | 190                          | 2355.8                            | 0.38            | 2.06          | 0.26              | 9.0       | 21.8           | 38.4 | 146                       | 17.5             | 52.5             | 30               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.17 | 1.16 | 0.1  | 4.1 | 2.31 | 0.49 | 54.4 | 1.3  | 11.2 | 5    |
| Average | 2.94 | 2.55 | 4.5  | 8.4 | 23.4 | 30.1 | 128  | 26   | 43   | 31   |
| Max     | 23.6 | 6.43 | 50.9 | 9.6 | 59.7 | 54.5 | 268  | 81.3 | 62.5 | 62.5 |
| Number  | 37   | 38   | 37   | 38  | 37   | 37   | 38   | 38   | 38   | 38   |

Depth to Coal: 67'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.46 | 1.62 | 0.39 | 4.1 | 2.31 | 0.49 | 54.4 | 12.5 | 22.5 | 12.5 |
| Average | 7.39 | 2.89 | 11.9 | 7.7 | 18.6 | 14.7 | 78.9 | 39   | 36   | 25   |
| Max     | 23.6 | 6.43 | 50.9 | 8.9 | 30.6 | 35   | 111  | 60   | 61.2 | 52.5 |
| Number  | 13   | 14   | 13   | 14  | 13   | 13   | 14   | 14   | 14   | 14   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.20

OVERBURDEN ANALYSIS DATA FOR SHOB-15C

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2555.2                         | 3                            | 2552.2                            | 20.5            | 5.83          | 17.5              | 7.8       | 44             | 10.1 | 95                        | 22.5             | 41.2             | 36.3             | Clay Loam       |
| 3                         | 2552.2                         | 8                            | 2547.2                            | 8.12            | 5.27          | 11.9              | 8.1       | 44             | 13.9 | 126                       | 32.5             | 40               | 27.5             | Clay Loam       |
| 9                         | 2546.2                         | 13                           | 2542.2                            | 10.7            | 6.29          | 14.7              | 7.7       | 53.5           | 15   | 88.8                      | 42.5             | 33.7             | 23.8             | Loam            |
| 25                        | 2530.2                         | 30                           | 2525.2                            | 0.79            | 1.84          | 0.57              | 9.0       | 17.2           | 20.8 | 108                       | 18.8             | 66.2             | 15               | Silt Loam       |
| 30                        | 2525.2                         | 34.5                         | 2520.7                            | 0.61            | 1.98          | 0.52              | 8.7       | 19.9           | 26.6 | 96.1                      | 38.8             | 43.7             | 17.5             | Loam            |
| 38.5                      | 2516.7                         | 43.5                         | 2511.7                            | 0.89            | 2.15          | 0.65              | 9.3       | 21.7           | 24.7 | 83.2                      | 13.8             | 66.2             | 20               | Silt Loam       |
| 44                        | 2511.2                         | 49                           | 2506.2                            | 1.17            | 2             | 0.8               | 9.1       | 19.6           | 19.8 | 106                       | 10               | 55               | 35               | Silty Clay Loam |
| 50                        | 2505.2                         | 55                           | 2500.2                            | 0.39            | 1.22          | 0.26              | 9.3       | 12.1           | 21.3 | 137                       | 12.5             | 60               | 27.5             | Silty Clay Loam |
| 55                        | 2500.2                         | 60                           | 2495.2                            | 0.39            | 1.16          | 0.24              | 9.2       | 11.3           | 20.2 | 131                       | 7.5              | 57.5             | 35               | Silty Clay Loam |
| 62.5                      | 2492.7                         | 65                           | 2490.2                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 66.5                      | 2488.7                         | 71.5                         | 2483.7                            | 0.52            | 1.56          | 0.35              | 9.3       | 15.9           | 24.1 | 108                       | 36.3             | 46.2             | 17.5             | Loam            |
| 74                        | 2481.2                         | 79                           | 2476.2                            | 0.71            | 1.3           | 0.42              | 9.2       | 13.2           | 17.5 | 65.9                      | 65               | 18.7             | 16.3             | Sandy Loam      |
| 81                        | 2474.2                         | 86                           | 2469.2                            | 0.85            | 1.34          | 0.58              | 9.1       | 13             | 15.4 | 73.1                      | 72.5             | 12.5             | 15               | Sandy Loam      |
| 103                       | 2452.2                         | 108                          | 2447.2                            | 0.43            | 1.03          | 0.29              | 9.2       | 10.2           | 17.1 | 141                       | 10               | 58.7             | 31.3             | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.39 | 1.03 | 0.24 | 7.7 | 10.2 | 10.1 | 65.9 | 7.5  | 12.5 | 15   |
| Average | 3.54 | 2.54 | 3.8  | 8.8 | 22.7 | 19.0 | 105  | 29   | 46   | 24   |
| Max     | 20.5 | 6.29 | 17.5 | 9.3 | 53.5 | 26.6 | 141  | 72.5 | 66.2 | 36.3 |
| Number  | 13   | 13   | 13   | 13  | 13   | 13   | 13   | 13   | 13   | 13   |

Depth to Coal: 86'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.39 | 1.16 | 0.24 | 7.7 | 11.3 | 10.1 | 65.9 | 7.5  | 12.5 | 15   |
| Average | 3.80 | 2.66 | 4.0  | 8.8 | 23.8 | 19.1 | 102  | 31   | 45   | 24   |
| Max     | 20.5 | 6.29 | 17.5 | 9.3 | 53.5 | 26.6 | 137  | 72.5 | 66.2 | 36.3 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12   | 12   | 12   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.21

OVERBURDEN ANALYSIS DATA FOR SHOB-16R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2529.2                         | 5                            | 2524.2                            | 2.17            | 0.91          | 2.1               | 7.6       | 5.06           | 3.47 | 73.5                      | 35               | 37.5             | 27.5             | Clay Loam       |
| 5                         | 2524.2                         | 10                           | 2519.2                            | 22.3            | 5.93          | 30.1              | 7.8       | 29.9           | 5.84 | 98.2                      | 40               | 30               | 30               | Clay Loam       |
| 10                        | 2519.2                         | 15                           | 2514.2                            | 23.5            | 7.88          | 43.5              | 7.8       | 45.8           | 7.91 | 98.3                      | 38.8             | 26.2             | 35               | Clay Loam       |
| 15                        | 2514.2                         | 20                           | 2509.2                            | 23.6            | 8.02          | 39.8              | 8.1       | 46.4           | 8.25 | 66                        | 22.5             | 50               | 27.5             | Clay Loam       |
| 20                        | 2509.2                         | 25                           | 2504.2                            | 18.1            | 6.17          | 27.4              | 8.0       | 37.4           | 7.84 | 72.5                      | 30               | 42.5             | 27.5             | Clay Loam       |
| 25                        | 2504.2                         | 30                           | 2499.2                            | 2.08            | 2.57          | 3.05              | 8.1       | 20.3           | 12.7 | 128                       | 15               | 55               | 30               | Silty Clay Loam |
| 30                        | 2499.2                         | 35                           | 2494.2                            | 1.11            | 2             | 1.57              | 8.6       | 16.4           | 14.2 | 149                       | 13.8             | 56.2             | 30               | Silty Clay Loam |
| 35                        | 2494.2                         | 40                           | 2489.2                            | 1.06            | 2.22          | 1.31              | 8.8       | 18.9           | 17.4 | 143                       | 18.8             | 53.7             | 27.5             | Silty Clay Loam |
| 40                        | 2489.2                         | 45                           | 2484.2                            | 1.79            | 2.85          | 2.38              | 8.5       | 24.6           | 17.1 | 125                       | 28.8             | 46.2             | 25               | Loam            |
| 45                        | 2484.2                         | 50                           | 2479.2                            | 16.6            | 7.49          | 26.7              | 8.2       | 55.2           | 11.8 | 51.9                      | 65               | 22.5             | 12.5             | Sandy Loam      |
| 50                        | 2479.2                         | 55                           | 2474.2                            | 5.03            | 5.67          | 7.97              | 8.6       | 49.2           | 19.3 | 54.3                      | 71.3             | 16.2             | 12.5             | Sandy Loam      |
| 55                        | 2474.2                         | 60                           | 2469.2                            | 1.55            | 3.82          | 2.17              | 8.8       | 33.8           | 24.8 | 63.8                      | 67.5             | 18.7             | 13.8             | Sandy Loam      |
| 60                        | 2469.2                         | 65                           | 2464.2                            | 21.2            | 8.08          | 22.3              | 7.8       | 62.2           | 13.4 | 43.7                      | 72.5             | 17.5             | 10               | Sandy Loam      |
| 65                        | 2464.2                         | 70                           | 2459.2                            | 10.8            | 5.31          | 14.5              | 7.4       | 39.7           | 11.2 | 43.4                      | 75               | 16.2             | 8.8              | Sandy Loam      |
| 70                        | 2459.2                         | 75                           | 2454.2                            | 21.3            | 9.63          | 26.3              | 7.0       | 83.2           | 17   | 47                        | 80               | 12.5             | 7.5              | Loamy Sand      |
| 75                        | 2454.2                         | 80                           | 2449.2                            | 17.2            | 7.2           | 19.1              | 6.9       | 62.2           | 14.6 | 69                        | 80               | 13.7             | 6.3              | Loamy Sand      |
| 80                        | 2449.2                         | 85                           | 2444.2                            | 21.1            | 8.94          | 25.6              | 6.9       | 82.7           | 17.1 | 64.7                      | 75               | 15               | 10               | Sandy Loam      |
| 85                        | 2444.2                         | 90                           | 2439.2                            | 2.1             | 3.73          | 2.26              | 8.0       | 33.4           | 22.6 | 149                       | 21.3             | 33.7             | 45               | Clay            |
| 90                        | 2439.2                         | 95                           | 2434.2                            | 0.74            | 2.38          | 0.74              | 8.4       | 21.5           | 25   | 161                       | 10               | 42.5             | 47.5             | Silty Clay      |
| 95                        | 2434.2                         | 100                          | 2429.2                            | 0.66            | 2.51          | 0.58              | 8.6       | 22.2           | 28.2 | 159                       | 12.5             | 38.7             | 48.8             | Clay            |

Statistical Summary

|         |      |      |      |     |      |      |      |    |      |      |
|---------|------|------|------|-----|------|------|------|----|------|------|
| Min     | 0.66 | 0.91 | 0.58 | 6.9 | 5.06 | 3.47 | 43.4 | 10 | 12.5 | 6.3  |
| Average | 10.7 | 5.17 | 15.0 | 8.0 | 39.5 | 15.0 | 93.0 | 44 | 32   | 24   |
| Max     | 23.6 | 9.63 | 43.5 | 8.8 | 83.2 | 28.2 | 161  | 80 | 56.2 | 48.8 |
| Number  | 20   | 20   | 20   | 20  | 20   | 20   | 20   | 20 | 20   | 20   |

Depth to Coal: 65'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |    |
|---------|------|------|------|-----|------|------|------|------|------|----|
| Min     | 1.06 | 0.91 | 1.31 | 7.6 | 5.06 | 3.47 | 43.7 | 13.8 | 16.2 | 10 |
| Average | 11   | 5    | 16   | 8   | 34   | 13   | 90   | 40   | 36   | 24 |
| Max     | 23.6 | 8.08 | 43.5 | 8.8 | 62.2 | 24.8 | 149  | 72.5 | 56.2 | 35 |
| Number  | 13   | 13   | 13   | 13  | 13   | 13   | 13   | 13   | 13   | 13 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.22

OVERBURDEN ANALYSIS DATA FOR SHOB-17R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2601.7                         | 5                            | 2596.7                            | 27.5            | 9.08          | 56.8              | 6.6       | 65.2           | 10   | 57.1                      | 27.5             | 43.7             | 28.8             | Clay Loam       |
| 5                         | 2596.7                         | 10                           | 2591.7                            | 21.2            | 8.69          | 39.7              | 4.6       | 80.9           | 14.7 | 58.1                      | 22.5             | 38.7             | 38.8             | Clay Loam       |
| 10                        | 2591.7                         | 15                           | 2586.7                            | 22.8            | 8.73          | 39.9              | 4.6       | 67.9           | 12.1 | 88.1                      | 8.8              | 39.9             | 51.3             | Clay            |
| 15                        | 2586.7                         | 20                           | 2581.7                            | 22.9            | 10.2          | 45.2              | 4.5       | 85.2           | 14.6 | 64.2                      | 20               | 47.5             | 32.5             | Silty Clay Loam |
| 20                        | 2581.7                         | 25                           | 2576.7                            | 5.21            | 4.54          | 14.1              | 7.7       | 32.5           | 10.5 | 143                       | 12.5             | 53.7             | 33.8             | Silty Clay Loam |
| 25                        | 2576.7                         | 30                           | 2571.7                            | 20.8            | 8.6           | 41                | 4.4       | 63.7           | 11.5 | 62                        | 25               | 56.2             | 18.8             | Silt Loam       |
| 30                        | 2571.7                         | 35                           | 2566.7                            | 7.5             | 5.84          | 18.2              | 7.7       | 47.5           | 13.2 | 46.4                      | 60               | 33.7             | 6.3              | Sandy Loam      |
| 35                        | 2566.7                         | 40                           | 2561.7                            | 3.45            | 4.5           | 7.61              | 7.9       | 40.5           | 17.2 | 40                        | 80               | 16.2             | 3.8              | Loamy Sand      |
| 40                        | 2561.7                         | 45                           | 2556.7                            | 5.83            | 4.7           | 6.94              | 8.0       | 41.5           | 16.4 | 39.2                      | 87.5             | 8.7              | 3.8              | Sand            |
| 45                        | 2556.7                         | 50                           | 2551.7                            | 2.65            | 2.84          | 3.07              | 8.2       | 23.6           | 13.9 | 34.9                      | 90               | 8.7              | 1.3              | Sand            |
| 50                        | 2551.7                         | 55                           | 2546.7                            | 6.56            | 4.46          | 7.11              | 8.0       | 36.6           | 14   | 36                        | 90               | 7.5              | 2.5              | Sand            |
| 55                        | 2546.7                         | 60                           | 2541.7                            | 3.81            | 3.81          | 5.42              | 8.2       | 32.8           | 15.3 | 35.1                      | 90               | 8.7              | 1.3              | Sand            |
| 60                        | 2541.7                         | 65                           | 2536.7                            | 8.46            | 4.49          | 10                | 8.1       | 35.5           | 11.7 | 37.6                      | 90               | 6.2              | 3.8              | Sand            |
| 65                        | 2536.7                         | 70                           | 2531.7                            | 2.39            | 2.89          | 4.5               | 8.3       | 22.6           | 12.2 | 38.6                      | 91.3             | 6.2              | 2.5              | Sand            |
| 70                        | 2531.7                         | 75                           | 2526.7                            | 4.53            | 3.2           | 8.27              | 8.2       | 23.1           | 9.13 | 37.6                      | 90               | 6.2              | 3.8              | Sand            |
| 75                        | 2526.7                         | 80                           | 2521.7                            | 3.81            | 2.43          | 4.79              | 7.8       | 20.8           | 10   | 42.6                      | 72.5             | 17.5             | 10               | Sandy Loam      |
| 80                        | 2521.7                         | 85                           | 2516.7                            | 8.15            | 3.35          | 9.84              | 7.7       | 22.7           | 7.56 | 44                        | 67.5             | 21.2             | 11.3             | Sandy Loam      |
| 85                        | 2516.7                         | 90                           | 2511.7                            | 1.73            | 1.69          | 1.87              | 8.3       | 13.7           | 10.2 | 94.3                      | 50               | 28.7             | 21.3             | Loam            |
| 90                        | 2511.7                         | 95                           | 2506.7                            | 1.83            | 1.38          | 2.11              | 8.2       | 10.2           | 7.29 | 129                       | 27.5             | 43.7             | 28.8             | Clay Loam       |
| 95                        | 2506.7                         | 100                          | 2501.7                            | 0.65            | 1.63          | 0.61              | 8.7       | 14.3           | 18   | 129                       | 47.5             | 31.2             | 21.3             | Loam            |
| 100                       | 2501.7                         | 105                          | 2496.7                            | 1.24            | 2.76          | 1.42              | 7.4       | 26.2           | 22.7 | 107                       | 62.5             | 20               | 17.5             | Sandy Loam      |
| 120                       | 2481.7                         | 125                          | 2476.7                            | 0.51            | 3.29          | 0.6               | 8.0       | 36.1           | 48.5 | 170                       | 32.5             | 25               | 42.5             | Clay            |
| 125                       | 2476.7                         | 130                          | 2471.7                            | 0.34            | 1.22          | 0.21              | 9.0       | 12.5           | 23.9 | 177                       | 11.3             | 28.7             | 60               | Clay            |
| 130                       | 2471.7                         | 135                          | 2466.7                            | 0.44            | 1.55          | 0.34              | 9.4       | 15.6           | 24.9 | 153                       | 32.5             | 38.7             | 28.8             | Clay Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |     |
|---------|------|------|------|-----|------|------|------|------|------|-----|
| Min     | 0.34 | 1.22 | 0.21 | 4.4 | 10.2 | 7.29 | 34.9 | 8.8  | 6.2  | 1.3 |
| Average | 7.68 | 4.41 | 13.7 | 7.5 | 36.3 | 15.4 | 77.7 | 54   | 27   | 20  |
| Max     | 27.5 | 10.2 | 56.8 | 9.4 | 85.2 | 48.5 | 177  | 91.3 | 56.2 | 60  |
| Number  | 24   | 24   | 24   | 24  | 24   | 24   | 24   | 24   | 24   | 24  |

Depth to Coal: 103'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.65 | 1.38 | 0.61 | 4.4 | 10.2 | 7.29 | 34.9 | 8.8  | 6.2  | 1.3  |
| Average | 8.71 | 4.75 | 15.6 | 7.3 | 38.4 | 13.0 | 64.9 | 58   | 26   | 16   |
| Max     | 27.5 | 10.2 | 56.8 | 8.7 | 85.2 | 22.7 | 143  | 91.3 | 56.2 | 51.3 |
| Number  | 21   | 21   | 21   | 21  | 21   | 21   | 21   | 21   | 21   | 21   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.23

OVERBURDEN ANALYSIS DATA FOR SHOB-18R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2593.9                         | 5                            | 2588.9                            | 22.8            | 3.23          | 14.4              | 7.6       | 9.63           | 2.24 | 110                       | 17.5             | 37.5             | 45               | Clay            |
| 5                         | 2588.9                         | 10                           | 2583.9                            | 19.2            | 6.33          | 23                | 7.8       | 49.4           | 10.7 | 138                       | 5                | 50               | 45               | Silty Clay      |
| 10                        | 2583.9                         | 15                           | 2578.9                            | 15.5            | 7.15          | 22.3              | 7.5       | 61.3           | 14.1 | 133                       | 15               | 47.5             | 37.5             | Silty Clay Loam |
| 15                        | 2578.9                         | 20                           | 2573.9                            | 20.9            | 13.1          | 40.1              | 5.7       | 136            | 24.6 | 101                       | 50               | 22.5             | 27.5             | Sandy Clay Loam |
| 20                        | 2573.9                         | 25                           | 2568.9                            | 10.5            | 7.53          | 16.5              | 7.0       | 74.7           | 20.4 | 142                       | 10               | 35               | 55               | Clay            |
| 25                        | 2568.9                         | 30                           | 2563.9                            | 6.02            | 6.48          | 9.18              | 7.8       | 64.9           | 23.5 | 169                       | 12.5             | 47.5             | 40               | Silty Clay Loam |
| 30                        | 2563.9                         | 35                           | 2558.9                            | 2.44            | 4.5           | 3.36              | 8.7       | 45.9           | 27   | 205                       | 7.5              | 52.5             | 40               | Silty Clay Loam |
| 35                        | 2558.9                         | 40                           | 2553.9                            | 3.81            | 5.33          | 5.55              | 8.3       | 52.3           | 24.2 | 154                       | 7.5              | 60               | 32.5             | Silty Clay Loam |
| 40                        | 2553.9                         | 45                           | 2548.9                            | 6.28            | 6.76          | 8.16              | 7.4       | 68.9           | 25.6 | 140                       | 12.5             | 50               | 37.5             | Silty Clay Loam |
| 45                        | 2548.9                         | 50                           | 2543.9                            | 5.43            | 6.85          | 8.16              | 7.5       | 70.2           | 26.9 | 123                       | 17.5             | 40               | 42.5             | Silty Clay      |
| 50                        | 2543.9                         | 55                           | 2538.9                            | 4.29            | 6.53          | 6.66              | 8.1       | 64.7           | 27.7 | 114                       | 5                | 52.5             | 42.5             | Silty Clay      |
| 55                        | 2538.9                         | 60                           | 2533.9                            | 7.34            | 9.17          | 11.5              | 7.7       | 96.2           | 31.4 | 109                       | 17.5             | 45               | 37.5             | Silty Clay Loam |
| 60                        | 2533.9                         | 65                           | 2528.9                            | 2.74            | 6.44          | 4.86              | 8.5       | 68.2           | 35   | 125                       | 7.5              | 55               | 37.5             | Silty Clay Loam |
| 65                        | 2528.9                         | 70                           | 2523.9                            | 2.84            | 6.23          | 4.91              | 8.6       | 69.9           | 35.5 | 121                       | 12.5             | 45               | 42.5             | Silty Clay      |
| 70                        | 2523.9                         | 75                           | 2518.9                            | 2.67            | 5.87          | 4.1               | 8.3       | 63             | 34.2 | 185                       | 10               | 42.5             | 47.5             | Silty Clay      |
| 75                        | 2518.9                         | 80                           | 2513.9                            | 3.33            | 6.95          | 5.05              | 8.5       | 76.3           | 37.3 | 152                       | 12.5             | 52.5             | 35               | Silty Clay Loam |
| 80                        | 2513.9                         | 85                           | 2508.9                            | 1.84            | 5.46          | 2.91              | 8.2       | 61.1           | 39.7 | 160                       | 5                | 42.5             | 52.5             | Silty Clay      |
| 85                        | 2508.9                         | 90                           | 2503.9                            | 1.54            | 5.59          | 2.61              | 8.7       | 58.9           | 40.8 | 170                       | 22.5             | 35               | 42.5             | Clay            |
| 90                        | 2503.9                         | 95                           | 2498.9                            | 28.9            | 26.5          | 93.7              | 8.3       | 345            | 44.1 | 64.3                      | 45               | 27.5             | 27.5             | Sandy Clay Loam |
| 115                       | 2478.9                         | 120                          | 2473.9                            | 1.04            | 4.16          | 1.73              | 8.7       | 45             | 38.3 | 256                       | 17.5             | 30               | 52.5             | Clay            |
| 120                       | 2473.9                         | 125                          | 2468.9                            | 1.54            | 4.96          | 2.42              | 8.5       | 53.5           | 38.1 | 186                       | 17.5             | 42.5             | 40               | Silty Clay Loam |
| 125                       | 2468.9                         | 130                          | 2463.9                            | 27.7            | 41.2          | 170               | 7.3       | 639            | 64.3 | 86.2                      | 42.5             | 25               | 32.5             | Clay Loam       |

Statistical Summary

|         |      |      |      |     |       |      |      |    |      |      |
|---------|------|------|------|-----|-------|------|------|----|------|------|
| Min     | 1.04 | 3.23 | 1.73 | 5.7 | 9.63  | 2.24 | 64.3 | 5  | 22.5 | 27.5 |
| Average | 9.03 | 8.92 | 21.0 | 7.9 | 103.4 | 30.3 | 143  | 17 | 43   | 41   |
| Max     | 28.9 | 41.2 | 170  | 8.7 | 639   | 64.3 | 256  | 50 | 60   | 55   |
| Number  | 22   | 22   | 22   | 22  | 22    | 22   | 22   | 22 | 22   | 22   |

Depth to Coal: 96'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |    |      |      |
|---------|------|------|------|-----|------|------|------|----|------|------|
| Min     | 1.54 | 3.23 | 2.61 | 5.7 | 9.63 | 2.24 | 64.3 | 5  | 22.5 | 27.5 |
| Average | 8.86 | 7.68 | 15.1 | 7.9 | 80.9 | 27.6 | 138  | 15 | 44   | 40   |
| Max     | 28.9 | 26.5 | 93.7 | 8.7 | 345  | 44.1 | 205  | 50 | 60   | 55   |
| Number  | 19   | 19   | 19   | 19  | 19   | 19   | 19   | 19 | 19   | 19   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.24

OVERBURDEN ANALYSIS DATA FOR SHOB-19R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2563.0                         | 5                            | 2558.0                            | 20.8            | 9.67          | 47.2              | 8.2       | 78.3           | 13.4 | 77.8                      | 20               | 37.5             | 42.5             | Clay            |
| 5                         | 2558.0                         | 10                           | 2553.0                            | 20.2            | 10.8          | 49.5              | 8.1       | 95.6           | 16.2 | 81.6                      | 11.3             | 38.7             | 50               | Clay            |
| 10                        | 2553.0                         | 15                           | 2548.0                            | 19.4            | 9.45          | 33.8              | 8.1       | 83             | 16.1 | 98.5                      | 2.5              | 37.5             | 60               | Clay            |
| 15                        | 2548.0                         | 20                           | 2543.0                            | 16.5            | 8             | 24                | 8.0       | 70.2           | 15.6 | 114                       | 2.5              | 50               | 47.5             | Silty Clay      |
| 20                        | 2543.0                         | 25                           | 2538.0                            | 4.14            | 4.4           | 6.08              | 8.0       | 41.1           | 18.2 | 121                       | 25               | 43.7             | 31.3             | Clay Loam       |
| 25                        | 2538.0                         | 30                           | 2533.0                            | 1.02            | 2.83          | 1.3               | 8.5       | 27.1           | 25.2 | 138                       | 13.8             | 48.7             | 37.5             | Silty Clay Loam |
| 30                        | 2533.0                         | 35                           | 2528.0                            | 0.3             | 1.95          | 0.41              | 9.0       | 18.8           | 31.5 | 226                       | 22.5             | 35               | 42.5             | Clay            |
| 35                        | 2528.0                         | 40                           | 2523.0                            | 0.24            | 1.86          | 0.31              | 9.2       | 18.1           | 34.7 | 105                       | 47.5             | 21.2             | 31.3             | Sandy Clay Loam |
| 40                        | 2523.0                         | 45                           | 2518.0                            | 0.61            | 3.16          | 0.69              | 7.4       | 33.7           | 41.9 | 69.9                      | 80               | 7.5              | 12.5             | Sandy Loam      |
| 55                        | 2508.0                         | 60                           | 2503.0                            | 0.34            | 2.74          | 0.35              | 7.7       | 29.1           | 49.5 | 77.6                      | 87.5             | 2.5              | 10               | Loamy Sand      |
| 60                        | 2503.0                         | 65                           | 2498.0                            | 0.38            | 1.03          | 0.21              | 9.4       | 10             | 18.4 | 227                       | 13.8             | 33.7             | 52.5             | Clay            |
| 65                        | 2498.0                         | 70                           | 2493.0                            | 0.42            | 1.08          | 0.23              | 9.5       | 10.5           | 18.5 | 169                       | 7.5              | 55               | 37.5             | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |     |    |
|---------|------|------|------|-----|------|------|------|------|-----|----|
| Min     | 0.24 | 1.03 | 0.21 | 7.4 | 10   | 13.4 | 69.9 | 2.5  | 2.5 | 10 |
| Average | 7.03 | 4.75 | 13.7 | 8.4 | 43.0 | 24.9 | 125  | 28   | 34  | 38 |
| Max     | 20.8 | 10.8 | 49.5 | 9.5 | 95.6 | 49.5 | 227  | 87.5 | 55  | 60 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12   | 12  | 12 |

Depth to Coal: 43'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |     |      |
|---------|------|------|------|-----|------|------|------|-----|-----|------|
| Min     | 0.24 | 1.86 | 0.31 | 7.4 | 18.1 | 13.4 | 69.9 | 2.5 | 7.5 | 12.5 |
| Average | 9.25 | 5.79 | 18.1 | 8.3 | 51.8 | 23.6 | 115  | 25  | 36  | 39   |
| Max     | 20.8 | 10.8 | 49.5 | 9.2 | 95.6 | 41.9 | 226  | 80  | 50  | 60   |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9   | 9   | 9    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



OVERBURDEN ANALYSIS DATA FOR SHOB-20R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2541.4                         | 5                            | 2536.4                            | 11.7            | 2.69          | 11.9              | 7.7       | 10.4           | 3.01 | 62.1                      | 20               | 41.2             | 38.8             | Silty Clay Loam |
| 5                         | 2536.4                         | 10                           | 2531.4                            | 4.65            | 5.84          | 13.2              | 8.5       | 56             | 18.7 | 42.1                      | 40               | 42.5             | 17.5             | Loam            |
| 10                        | 2531.4                         | 15                           | 2526.4                            | 0.9             | 1.98          | 1.08              | 8.5       | 18.8           | 18.9 | 164                       | 7.5              | 57.5             | 35               | Silty Clay Loam |
| 15                        | 2526.4                         | 20                           | 2521.4                            | 1.26            | 2.26          | 1.33              | 8.4       | 24.2           | 21.2 | 127                       | 7.5              | 61.2             | 31.3             | Silty Clay Loam |
| 20                        | 2521.4                         | 25                           | 2516.4                            | 4.26            | 4.27          | 4.35              | 8.3       | 39.8           | 19.2 | 116                       | 55               | 21.2             | 23.8             | Sandy Clay Loam |
| 25                        | 2516.4                         | 30                           | 2511.4                            | 0.73            | 2.47          | 0.95              | 8.6       | 24.1           | 26.2 | 155                       | 25               | 43.7             | 31.3             | Clay Loam       |
| 30                        | 2511.4                         | 35                           | 2506.4                            | 0.87            | 3.46          | 1.26              | 8.8       | 37.6           | 36.4 | 168                       | 5                | 56.2             | 38.8             | Silty Clay Loam |
| 35                        | 2506.4                         | 40                           | 2501.4                            | 0.72            | 2.42          | 0.75              | 8.9       | 27.6           | 32.1 | 142                       | 7.5              | 57.5             | 35               | Silty Clay Loam |
| 55                        | 2486.4                         | 60                           | 2481.4                            | 1.42            | 4.1           | 1.6               | 7.1       | 45             | 36.6 | 83                        | 68.8             | 17.4             | 13.8             | Sandy Loam      |
| 60                        | 2481.4                         | 65                           | 2476.4                            | 0.5             | 2.75          | 0.51              | 8.7       | 29.1           | 41   | 109                       | 10               | 66.2             | 23.8             | Silt Loam       |
| 65                        | 2476.4                         | 70                           | 2471.4                            | 0.5             | 2.38          | 0.37              | 9.1       | 26.3           | 39.7 | 140                       | 10               | 63.7             | 26.3             | Silt Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.5  | 1.98 | 0.37 | 7.1 | 10.4 | 3.01 | 42.1 | 5    | 17.4 | 13.8 |
| Average | 2.50 | 3.15 | 3.39 | 8.4 | 30.8 | 26.6 | 119  | 23   | 48   | 29   |
| Max     | 11.7 | 5.84 | 13.2 | 9.1 | 56   | 41   | 168  | 68.8 | 66.2 | 38.8 |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11   | 11   | 11   |

Depth to Coal: 40'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |    |      |      |
|---------|------|------|------|-----|------|------|------|----|------|------|
| Min     | 0.72 | 1.98 | 0.75 | 7.7 | 10.4 | 3.01 | 42.1 | 5  | 21.2 | 17.5 |
| Average | 3.14 | 3.17 | 4.35 | 8.5 | 29.8 | 22.0 | 122  | 21 | 48   | 31   |
| Max     | 11.7 | 5.84 | 13.2 | 8.9 | 56   | 36.4 | 168  | 55 | 61.2 | 38.8 |
| Number  | 8    | 8    | 8    | 8   | 8    | 8    | 8    | 8  | 8    | 8    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.26

OVERBURDEN ANALYSIS DATA FOR SHOB-21R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2527.6                         | 5                            | 2522.6                            | 3.05            | 2.34          | 3.73              | 8.0       | 18.3           | 9.94 | 114                       | 47.5             | 23.7             | 28.8             | Sandy Clay Loam |
| 5                         | 2522.6                         | 10                           | 2517.6                            | 20.8            | 6.85          | 21.6              | 7.8       | 51.8           | 11.2 | 105                       | 45               | 23.7             | 31.3             | Sandy Clay Loam |
| 10                        | 2517.6                         | 15                           | 2512.6                            | 3.06            | 3.77          | 4.86              | 8.5       | 32.4           | 16.3 | 167                       | 22.5             | 47.5             | 30               | Clay Loam       |
| 15                        | 2512.6                         | 20                           | 2507.6                            | 1.3             | 2.9           | 2.46              | 8.6       | 25.5           | 18.6 | 196                       | 8.8              | 59.9             | 31.3             | Silty Clay Loam |
| 20                        | 2507.6                         | 25                           | 2502.6                            | 0.65            | 1.9           | 1                 | 8.0       | 16.5           | 18.1 | 182                       | 10               | 56.2             | 33.8             | Silty Clay Loam |
| 25                        | 2502.6                         | 30                           | 2497.6                            | 0.51            | 1.7           | 0.68              | 8.7       | 15             | 19.4 | 148                       | 16.3             | 56.2             | 27.5             | Silty Clay Loam |
| 30                        | 2497.6                         | 35                           | 2492.6                            | 0.41            | 1.46          | 0.47              | 9.0       | 13.3           | 20.1 | 183                       | 6.3              | 56.2             | 37.5             | Silty Clay Loam |
| 35                        | 2492.6                         | 40                           | 2487.6                            | 0.69            | 1.84          | 0.6               | 8.9       | 16.8           | 20.9 | 182                       | 5                | 63.7             | 31.3             | Silty Clay Loam |
| 40                        | 2487.6                         | 45                           | 2482.6                            | 0.81            | 2.54          | 0.64              | 9.0       | 23             | 27.1 | 82.3                      | 68.8             | 16.2             | 15               | Sandy Loam      |
| 45                        | 2482.6                         | 50                           | 2477.6                            | 0.54            | 1.68          | 0.41              | 9.0       | 14.8           | 21.5 | 92.4                      | 70               | 12.5             | 17.5             | Sandy Loam      |
| 75                        | 2452.6                         | 80                           | 2447.6                            | 0.32            | 1.46          | 0.25              | 9.2       | 13.5           | 25.4 | 126                       | 30               | 48.7             | 21.3             | Loam            |
| 80                        | 2447.6                         | 85                           | 2442.6                            | 0.3             | 1.48          | 0.26              | 8.9       | 13.9           | 26.2 | 119                       | 52.5             | 28.7             | 18.8             | Sandy Loam      |
| 85                        | 2442.6                         | 90                           | 2437.6                            | 0.43            | 1.99          | 0.35              | 8.9       | 19.6           | 31.2 | 87.1                      | 72.5             | 15               | 12.5             | Sandy Loam      |
| 90                        | 2437.6                         | 95                           | 2432.6                            | 0.46            | 1.88          | 0.35              | 9.2       | 18.8           | 29.5 | 74                        | 77.5             | 12.5             | 10               | Sandy Loam      |
| 95                        | 2432.6                         | 100                          | 2427.6                            | 0.38            | 1.48          | 0.31              | 8.9       | 15.1           | 25.7 | 141                       | 52.5             | 26.2             | 21.3             | Sandy Clay Loam |
| 100                       | 2427.6                         | 105                          | 2422.6                            | 0.37            | 1.92          | 0.36              | 8.8       | 18.8           | 31.2 | 73.9                      | 82.5             | 10               | 7.5              | Loamy Sand      |
| 105                       | 2422.6                         | 110                          | 2417.6                            | 0.31            | 1.63          | 0.34              | 9.2       | 16.8           | 29.5 | 60.3                      | 75               | 11.2             | 13.8             | Sandy Loam      |
| 110                       | 2417.6                         | 115                          | 2412.6                            | 0.21            | 2.16          | 0.3               | 9.6       | 22.2           | 44   | 71.8                      | 82.5             | 10               | 7.5              | Loamy Sand      |
| 115                       | 2412.6                         | 120                          | 2407.6                            | 0.34            | 2.05          | 0.33              | 9.5       | 21.3           | 36.8 | 63.3                      | 87.5             | 5                | 7.5              | Loamy Sand      |
| 120                       | 2407.6                         | 125                          | 2402.6                            | 0.46            | 1.87          | 0.45              | 8.6       | 17.2           | 25.6 | 75                        | 66.3             | 18.7             | 15               | Sandy Loam      |
| 125                       | 2402.6                         | 130                          | 2397.6                            | 0.32            | 1.45          | 0.33              | 9.4       | 15.6           | 27.2 | 50.6                      | 68.8             | 17.4             | 13.8             | Sandy Loam      |
| 130                       | 2397.6                         | 135                          | 2392.6                            | 0.47            | 2.45          | 0.53              | 8.9       | 23.9           | 33.8 | 75.1                      | 68.8             | 16.2             | 15               | Sandy Loam      |
| 135                       | 2392.6                         | 140                          | 2387.6                            | 0.36            | 2.55          | 0.38              | 9.4       | 24.4           | 40.3 | 66.3                      | 86.3             | 7.4              | 6.3              | Loamy Sand      |
| 140                       | 2387.6                         | 145                          | 2382.6                            | 2.31            | 3.18          | 2.73              | 8.3       | 27.1           | 17.1 | 107                       | 40               | 33.7             | 26.3             | Loam            |
| 145                       | 2382.6                         | 150                          | 2377.6                            | 1.23            | 3.32          | 1.14              | 8.2       | 33.7           | 31   | 114                       | 50               | 26.2             | 23.8             | Sandy Clay Loam |
| 150                       | 2377.6                         | 155                          | 2372.6                            | 0.54            | 2.69          | 0.47              | 8.1       | 26.8           | 37.7 | 116                       | 30               | 43.7             | 26.3             | Loam            |
| 155                       | 2372.6                         | 160                          | 2367.6                            | 0.4             | 1.38          | 0.26              | 8.9       | 13.3           | 23.3 | 126                       | 10               | 61.2             | 28.8             | Silty Clay Loam |
| 160                       | 2367.6                         | 165                          | 2362.6                            | 0.89            | 2.72          | 0.62              | 8.8       | 26.1           | 33.4 | 117                       | 27.5             | 45               | 27.5             | Clay Loam       |
| 165                       | 2362.6                         | 170                          | 2357.6                            | 0.42            | 1.18          | 0.24              | 9.0       | 11.1           | 19.5 | 130                       | 6.3              | 58.7             | 35               | Silty Clay Loam |
| 170                       | 2357.6                         | 175                          | 2352.6                            | 0.37            | 1.01          | 0.23              | 9.0       | 9.19           | 16.8 | 141                       | 5                | 52.5             | 42.5             | Silty Clay      |
| 175                       | 2352.6                         | 180                          | 2347.6                            | 0.45            | 0.84          | 0.25              | 9.1       | 8.39           | 14.3 | 142                       | 7.5              | 55               | 37.5             | Silty Clay Loam |
| 180                       | 2347.6                         | 185                          | 2342.6                            | 0.5             | 0.91          | 0.29              | 9.1       | 8.69           | 13.8 | 121                       | 25               | 42.5             | 32.5             | Clay Loam       |
| 185                       | 2342.6                         | 190                          | 2337.6                            | 0.35            | 1.05          | 0.23              | 9.2       | 9.36           | 17.5 | 119                       | 32.5             | 37.5             | 30               | Clay Loam       |
| 190                       | 2337.6                         | 195                          | 2332.6                            | 0.34            | 1.19          | 0.29              | 9.1       | 11.3           | 19.9 | 120                       | 17.5             | 38.7             | 43.8             | Clay            |
| 195                       | 2332.6                         | 200                          | 2327.6                            | 0.62            | 3.08          | 0.62              | 8.8       | 32             | 40.6 | 123                       | 8.8              | 33.7             | 57.5             | Clay            |
| 200                       | 2327.6                         | 205                          | 2322.6                            | 0.32            | 1.42          | 0.26              | 8.9       | 13             | 24.2 | 124                       | 23.8             | 33.7             | 42.5             | Clay            |
| 205                       | 2322.6                         | 210                          | 2317.6                            | 0.44            | 1.02          | 0.35              | 8.3       | 9.44           | 15   | 134                       | 25               | 32.5             | 42.5             | Clay            |
| 210                       | 2317.6                         | 215                          | 2312.6                            | 0.67            | 3.47          | 0.54              | 7.6       | 36.4           | 46.9 | 102                       | 40               | 27.5             | 32.5             | Clay Loam       |
| 215                       | 2312.6                         | 220                          | 2307.6                            | 0.54            | 1.91          | 0.36              | 8.2       | 18.8           | 28.1 | 115                       | 25               | 37.5             | 37.5             | Clay Loam       |
| 220                       | 2307.6                         | 225                          | 2302.6                            | 0.45            | 1.46          | 0.29              | 7.9       | 15.1           | 24.8 | 110                       | 37.5             | 30               | 32.5             | Clay Loam       |
| 235                       | 2292.6                         | 240                          | 2287.6                            | 0.36            | 2.44          | 0.51              | 8.3       | 28             | 42.5 | 129                       | 12.5             | 45               | 42.5             | Silty Clay      |
| 240                       | 2287.6                         | 245                          | 2282.6                            | 0.49            | 2.1           | 0.37              | 8.7       | 22.6           | 34.5 | 148                       | 12.5             | 45               | 42.5             | Silty Clay      |
| 245                       | 2282.6                         | 250                          | 2277.6                            | 0.38            | 1.21          | 0.3               | 8.7       | 11             | 18.8 | 162                       | 15               | 37.5             | 47.5             | Clay            |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.21 | 0.84 | 0.23 | 7.6 | 8.39 | 9.94 | 50.6 | 5    | 5    | 6.3  |
| Average | 1.13 | 2.07 | 1.19 | 8.7 | 19.5 | 25.8 | 117  | 38   | 34   | 28   |
| Max     | 20.8 | 6.85 | 21.6 | 9.6 | 51.8 | 46.9 | 196  | 87.5 | 63.7 | 57.5 |
| Number  | 43   | 43   | 43   | 43  | 43   | 43   | 43   | 43   | 43   | 43   |

Depth to Coal: 53'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |    |      |      |
|---------|------|------|------|-----|------|------|------|----|------|------|
| Min     | 0.41 | 1.46 | 0.41 | 7.8 | 13.3 | 9.94 | 82.3 | 5  | 12.5 | 15   |
| Average | 3.18 | 2.70 | 3.65 | 8.6 | 22.7 | 18.3 | 145  | 30 | 42   | 28   |
| Max     | 20.8 | 6.85 | 21.6 | 9   | 51.8 | 27.1 | 196  | 70 | 63.7 | 37.5 |
| Number  | 10   | 10   | 10   | 10  | 10   | 10   | 10   | 10 | 10   | 10   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-22R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2519.8                         | 5                            | 2514.8                            | 13.7            | 9.21          | 62.3              | 8.2       | 74.6           | 12.1 | 81.3                      | 37.5             | 27.5             | 35               | Clay Loam       |
| 5                         | 2514.8                         | 10                           | 2509.8                            | 0.44            | 0.85          | 0.92              | 8.3       | 7.15           | 8.64 | 92.5                      | 27.5             | 52.5             | 20               | Silt Loam       |
| 10                        | 2509.8                         | 15                           | 2504.8                            | 1.05            | 0.79          | 1.69              | 7.7       | 5.67           | 4.84 | 137                       | 10               | 50               | 40               | Silty Clay Loam |
| 15                        | 2504.8                         | 20                           | 2499.8                            | 0.58            | 0.6           | 0.7               | 7.9       | 4.47           | 5.57 | 109                       | 12.5             | 57.5             | 30               | Silty Clay Loam |
| 20                        | 2499.8                         | 25                           | 2494.8                            | 0.44            | 0.58          | 0.47              | 8.0       | 5.03           | 7.43 | 142                       | 7.5              | 52.5             | 40               | Silty Clay Loam |
| 25                        | 2494.8                         | 30                           | 2489.8                            | 0.68            | 0.63          | 0.66              | 8.1       | 5.11           | 6.25 | 137                       | 7.5              | 50               | 42.5             | Silty Clay      |
| 30                        | 2489.8                         | 35                           | 2484.8                            | 0.94            | 0.63          | 1.01              | 7.8       | 4.65           | 4.71 | 53.6                      | 62.5             | 20               | 17.5             | Sandy Loam      |
| 35                        | 2484.8                         | 40                           | 2479.8                            | 3.34            | 1.54          | 4.35              | 6.7       | 10.3           | 5.27 | 78.3                      | 62.5             | 20               | 17.5             | Sandy Loam      |
| 55                        | 2464.8                         | 60                           | 2459.8                            | 0.45            | 1.34          | 0.4               | 8.7       | 14.6           | 22.4 | 147                       | 12.5             | 52.5             | 35               | Silty Clay Loam |
| 60                        | 2459.8                         | 65                           | 2454.8                            | 0.32            | 1.24          | 0.23              | 8.9       | 12.8           | 24.5 | 125                       | 12.5             | 60               | 27.5             | Silty Clay Loam |
| 65                        | 2454.8                         | 70                           | 2449.8                            | 0.63            | 1.91          | 0.47              | 9.2       | 21.4           | 29   | 143                       | 10               | 65               | 25               | Silt Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |    |      |
|---------|------|------|------|-----|------|------|------|------|----|------|
| Min     | 0.32 | 0.58 | 0.23 | 6.7 | 4.47 | 4.71 | 53.6 | 7.5  | 20 | 17.5 |
| Average | 2.05 | 1.76 | 6.65 | 8.1 | 15.1 | 11.9 | 113  | 24   | 46 | 30   |
| Max     | 13.7 | 9.21 | 62.3 | 9.2 | 74.6 | 29   | 147  | 62.5 | 65 | 42.5 |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11   | 11 | 11   |

Depth to Coal: 39'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.44 | 0.58 | 0.47 | 6.7 | 4.47 | 4.71 | 53.6 | 7.5  | 20   | 17.5 |
| Average | 2.65 | 1.85 | 9.01 | 7.8 | 14.6 | 6.9  | 104  | 28   | 41   | 30   |
| Max     | 13.7 | 9.21 | 62.3 | 8.3 | 74.6 | 12.1 | 142  | 62.5 | 57.5 | 42.5 |
| Number  | 8    | 8    | 8    | 8   | 8    | 8    | 8    | 8    | 8    | 8    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-23R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2523.5                         | 5                            | 2518.5                            | 24.4            | 4.35          | 26.4              | 7.6       | 12.9           | 2.56 | 122                       | 12.5             | 33.7             | 53.8             | Clay            |
| 5                         | 2518.5                         | 10                           | 2513.5                            | 25.4            | 6.16          | 40.2              | 7.5       | 31.2           | 5.45 | 112                       | 11.3             | 43.7             | 45               | Silty Clay      |
| 10                        | 2513.5                         | 15                           | 2508.5                            | 19.9            | 5.15          | 35.2              | 7.8       | 23.7           | 4.52 | 108                       | 10               | 47.5             | 42.5             | Silty Clay      |
| 15                        | 2508.5                         | 20                           | 2503.5                            | 26.3            | 7.09          | 50.4              | 6.0       | 36.5           | 5.89 | 102                       | 7.5              | 45               | 47.5             | Silty Clay      |
| 20                        | 2503.5                         | 25                           | 2498.5                            | 15.9            | 5.06          | 28.7              | 7.0       | 24.5           | 5.19 | 114                       | 10               | 43.7             | 46.3             | Silty Clay      |
| 25                        | 2498.5                         | 30                           | 2493.5                            | 3.85            | 1.83          | 7.18              | 8.2       | 9.87           | 4.2  | 125                       | 8.8              | 56.2             | 35               | Silty Clay Loam |
| 30                        | 2493.5                         | 35                           | 2488.5                            | 4.34            | 2.1           | 6.87              | 8.0       | 11.1           | 4.68 | 95.9                      | 11.3             | 61.2             | 27.5             | Silty Clay Loam |
| 35                        | 2488.5                         | 40                           | 2483.5                            | 1.95            | 1.65          | 3.26              | 8.3       | 12.2           | 7.57 | 109                       | 12.5             | 57.5             | 30               | Silty Clay Loam |
| 40                        | 2483.5                         | 45                           | 2478.5                            | 1.63            | 2.48          | 2.98              | 8.6       | 21             | 13.9 | 151                       | 10               | 52.5             | 37.5             | Silty Clay Loam |
| 45                        | 2478.5                         | 50                           | 2473.5                            | 0.54            | 1.66          | 0.68              | 9.0       | 15             | 19.2 | 149                       | 8.8              | 57.4             | 33.8             | Silty Clay Loam |
| 50                        | 2473.5                         | 55                           | 2468.5                            | 0.28            | 1.58          | 0.32              | 9.1       | 15.1           | 27.7 | 159                       | 20               | 42.5             | 37.5             | Silty Clay Loam |
| 55                        | 2468.5                         | 60                           | 2463.5                            | 0.83            | 3.31          | 1.12              | 8.9       | 36.8           | 37.3 | 145                       | 10               | 50               | 40               | Silty Clay Loam |
| 60                        | 2463.5                         | 65                           | 2458.5                            | 0.44            | 2.05          | 0.46              | 9.1       | 20.4           | 30.4 | 135                       | 12.5             | 55               | 32.5             | Silty Clay Loam |
| 65                        | 2458.5                         | 70                           | 2453.5                            | 2.91            | 4.79          | 3.74              | 8.8       | 51.3           | 28.1 | 184                       | 7.5              | 55               | 37.5             | Silty Clay Loam |
| 70                        | 2453.5                         | 75                           | 2448.5                            | 2.83            | 5.22          | 4.09              | 8.8       | 56.2           | 30.2 | 154                       | 12.5             | 47.5             | 40               | Silty Clay Loam |
| 90                        | 2433.5                         | 95                           | 2428.5                            | 0.59            | 2.62          | 0.85              | 8.8       | 26.8           | 31.6 | 181                       | 10               | 47.5             | 42.5             | Silty Clay      |
| 95                        | 2428.5                         | 100                          | 2423.5                            | 0.57            | 3.26          | 0.95              | 9.1       | 34.6           | 39.7 | 179                       | 7.5              | 50               | 42.5             | Silty Clay      |
| 100                       | 2423.5                         | 105                          | 2418.5                            | 1.35            | 4.16          | 1.46              | 8.8       | 45.4           | 38.3 | 175                       | 12.5             | 35               | 52.5             | Clay            |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.28 | 1.58 | 0.32 | 6   | 9.87 | 2.56 | 95.9 | 7.5 | 33.7 | 27.5 |
| Average | 7.45 | 3.58 | 11.9 | 8.3 | 26.9 | 18.7 | 139  | 11  | 49   | 40   |
| Max     | 26.3 | 7.09 | 50.4 | 9.1 | 56.2 | 39.7 | 184  | 20  | 61.2 | 53.8 |
| Number  | 18   | 18   | 18   | 18  | 18   | 18   | 18   | 18  | 18   | 18   |

Depth to Coal: 74'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.28 | 1.58 | 0.32 | 6   | 9.87 | 2.56 | 95.9 | 7.5 | 33.7 | 27.5 |
| Average | 8.77 | 3.63 | 14.1 | 8.2 | 25.2 | 15.1 | 131  | 11  | 50   | 39   |
| Max     | 26.3 | 7.09 | 50.4 | 9.1 | 56.2 | 37.3 | 184  | 20  | 61.2 | 53.8 |
| Number  | 15   | 15   | 15   | 15  | 15   | 15   | 15   | 15  | 15   | 15   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-24R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2502.6                         | 5                            | 2497.6                            | 0.93            | 0.66          | 0.73              | 8.2       | 4.92           | 5.4  | 122                       | 12.5             | 37.5             | 50               | Clay            |
| 5                         | 2497.6                         | 10                           | 2492.6                            | 6.71            | 3.33          | 6.51              | 8.0       | 26.8           | 10.4 | 138                       | 15               | 45               | 40               | Silty Clay Loam |
| 10                        | 2492.6                         | 15                           | 2487.6                            | 18              | 5.72          | 18.2              | 7.7       | 42.9           | 10.1 | 114                       | 10               | 47.5             | 42.5             | Silty Clay      |
| 15                        | 2487.6                         | 20                           | 2482.6                            | 20              | 5.98          | 27.3              | 7.9       | 41.5           | 8.54 | 55.9                      | 50               | 26.2             | 23.8             | Sandy Clay Loam |
| 20                        | 2482.6                         | 25                           | 2477.6                            | 7.34            | 1.86          | 6.72              | 7.9       | 9.52           | 3.59 | 101                       | 70               | 10               | 20               | Sandy Clay Loam |
| 25                        | 2477.6                         | 30                           | 2472.6                            | 6.03            | 1.54          | 4.89              | 8.0       | 6.58           | 2.82 | 39.1                      | 62.5             | 21.2             | 16.3             | Sandy Loam      |
| 30                        | 2472.6                         | 35                           | 2467.6                            | 1.29            | 0.84          | 1.19              | 8.2       | 6.28           | 5.64 | 105                       | 30               | 47.5             | 22.5             | Loam            |
| 35                        | 2467.6                         | 40                           | 2462.6                            | 0.31            | 0.62          | 0.23              | 8.8       | 5.78           | 11.1 | 136                       | 12.5             | 53.7             | 33.8             | Silty Clay Loam |
| 40                        | 2462.6                         | 45                           | 2457.6                            | 0.26            | 0.74          | 0.18              | 9.3       | 7.19           | 15.4 | 164                       | 17.5             | 45               | 37.5             | Silty Clay Loam |
| 45                        | 2457.6                         | 50                           | 2452.6                            | 0.35            | 1.04          | 0.3               | 9.0       | 9.77           | 17.1 | 159                       | 10               | 57.5             | 32.5             | Silty Clay Loam |
| 50                        | 2452.6                         | 55                           | 2447.6                            | 0.29            | 1.04          | 0.28              | 8.9       | 10.5           | 19.7 | 153                       | 7.5              | 50               | 42.5             | Silty Clay      |
| 55                        | 2447.6                         | 60                           | 2442.6                            | 0.4             | 1.06          | 0.34              | 9.1       | 10.4           | 17   | 153                       | 15               | 47.5             | 37.5             | Silty Clay Loam |
| 60                        | 2442.6                         | 65                           | 2437.6                            | 0.31            | 0.94          | 0.31              | 8.8       | 9.22           | 16.6 | 144                       | 12.5             | 52.5             | 35               | Silty Clay Loam |
| 80                        | 2422.6                         | 85                           | 2417.6                            | 0.45            | 1.2           | 0.45              | 7.8       | 11.4           | 17.1 | 159                       | 20               | 40               | 40               | Silty Clay Loam |
| 85                        | 2417.6                         | 90                           | 2412.6                            | 0.38            | 1.13          | 0.35              | 8.5       | 11             | 18.1 | 163                       | 8.8              | 33.7             | 57.5             | Clay            |
| 90                        | 2412.6                         | 95                           | 2407.6                            | 0.33            | 0.94          | 0.29              | 8.9       | 8.77           | 15.8 | 135                       | 17.5             | 48.7             | 33.8             | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.26 | 0.62 | 0.18 | 7.7 | 4.92 | 2.82 | 39.1 | 7.5 | 10   | 16.3 |
| Average | 3.96 | 1.79 | 4.27 | 8.4 | 13.9 | 12.1 | 128  | 23  | 41   | 35   |
| Max     | 20   | 5.98 | 27.3 | 9.3 | 42.9 | 19.7 | 164  | 70  | 57.5 | 57.5 |
| Number  | 16   | 16   | 16   | 16  | 16   | 16   | 16   | 16  | 16   | 16   |

Depth to Coal: 65'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.26 | 0.62 | 0.18 | 7.7 | 4.92 | 2.82 | 39.1 | 7.5 | 10   | 16.3 |
| Average | 4.79 | 1.95 | 5.17 | 8.4 | 14.7 | 11.0 | 122  | 25  | 42   | 33   |
| Max     | 20   | 5.98 | 27.3 | 9.3 | 42.9 | 19.7 | 164  | 70  | 57.5 | 50   |
| Number  | 13   | 13   | 13   | 13  | 13   | 13   | 13   | 13  | 13   | 13   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



OVERBURDEN ANALYSIS DATA FOR SHOB-25C

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture    |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|------------|
| 0                         | 2568.1                         | 5                            | 2563.1                            | 1.52            | 1.36          | 2.81              | 8.2       | 11.9           | 8.1  | 79.9                      | 15               | 41.2             | 43.8             | Silty Clay |
| 6                         | 2562.1                         | 11                           | 2557.1                            | 15.3            | 5.81          | 23                | 8.0       | 41.9           | 9.57 | 89.1                      | 7.5              | 48.7             | 43.8             | Silty Clay |
| 20                        | 2548.1                         | 23.5                         | 2544.6                            | 4.71            | 2.29          | 5.23              | 8.0       | 15.9           | 7.12 | 40.6                      | 31.3             | 56.2             | 12.5             | Silt Loam  |
| 26                        | 2542.1                         | 31                           | 2537.1                            | 4.76            | 1.78          | 5.78              | 8.0       | 9.45           | 4.12 | 64.1                      | 21.3             | 62.4             | 16.3             | Silt Loam  |
| 31                        | 2537.1                         | 36                           | 2532.1                            | 4.49            | 1.48          | 4.86              | 8.1       | 6.69           | 3.1  | 55.4                      | 41.3             | 46.2             | 12.5             | Loam       |
| 36                        | 2532.1                         | 40                           | 2528.1                            | 4.34            | 1.46          | 6.88              | 8.0       | 5.1            | 2.15 | 52.6                      | 56.3             | 36.2             | 7.5              | Sandy Loam |
| 44                        | 2524.1                         | 49                           | 2519.1                            | 9.33            | 3.23          | 27.51             | 8.0       | 7.4            | 1.72 | 54.8                      | 48.8             | 38.7             | 12.5             | Loam       |
| 55                        | 2513.1                         | 60                           | 2508.1                            | 20.2            | 5.43          | 54.3              | 8.0       | 12             | 1.97 | 43.6                      | 76.3             | 16.2             | 7.5              | Sandy Loam |
| 75.5                      | 2492.6                         | 80                           | 2488.1                            | 0.63            | 0.85          | 0.87              | 9.3       | 8.63           | 9.95 | 145                       | 23.8             | 57.4             | 18.8             | Silt Loam  |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.63 | 0.85 | 0.87 | 8   | 5.1  | 1.72 | 40.6 | 7.5  | 16.2 | 7.5  |
| Average | 7.25 | 2.63 | 14.6 | 8.2 | 13.2 | 5.3  | 69.5 | 36   | 45   | 19   |
| Max     | 20.2 | 5.81 | 54.3 | 9.3 | 41.9 | 9.95 | 145  | 76.3 | 62.4 | 43.8 |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9    | 9    | 9    |

Depth to Coal: 60'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 1.52 | 1.36 | 2.81 | 8   | 5.1  | 1.72 | 40.6 | 7.5  | 16.2 | 7.5  |
| Average | 8.08 | 2.86 | 16.3 | 8.0 | 13.8 | 4.7  | 60.0 | 37   | 43   | 20   |
| Max     | 20.2 | 5.81 | 54.3 | 8.2 | 41.9 | 9.57 | 89.1 | 76.3 | 62.4 | 43.8 |
| Number  | 8    | 8    | 8    | 8   | 8    | 8    | 8    | 8    | 8    | 8    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.31

OVERBURDEN ANALYSIS DATA FOR SHOB-26R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2545.2                         | 5                            | 2540.2                            | 1.68            | 0.35          | 2.16              | 8.0       | 0.32           | 0.23 | 85.9                      | 81.3             | 12.4             | 6.3              | Loamy Sand      |
| 5                         | 2540.2                         | 10                           | 2535.2                            | 0.46            | 0.43          | 3.2               | 8.4       | 0.91           | 0.68 | 60.8                      | 45               | 45               | 10               | Loam            |
| 10                        | 2535.2                         | 15                           | 2530.2                            | 0.87            | 0.43          | 2.17              | 8.2       | 1.31           | 1.06 | 54.9                      | 71.3             | 22.4             | 6.3              | Sandy Loam      |
| 15                        | 2530.2                         | 20                           | 2525.2                            | 1.74            | 0.55          | 2.33              | 8.1       | 1.32           | 0.92 | 48                        | 67.5             | 22.5             | 10               | Sandy Loam      |
| 20                        | 2525.2                         | 25                           | 2520.2                            | 3.58            | 0.78          | 3.47              | 8.0       | 1.54           | 0.82 | 49.2                      | 67.5             | 26.2             | 6.3              | Sandy Loam      |
| 25                        | 2520.2                         | 30                           | 2515.2                            | 1.38            | 0.35          | 1.18              | 8.2       | 0.88           | 0.78 | 45.5                      | 82.5             | 16.2             | 1.3              | Loamy Sand      |
| 30                        | 2515.2                         | 35                           | 2510.2                            | 1.89            | 0.45          | 1.63              | 8.2       | 1.19           | 0.9  | 50.6                      | 75               | 18.7             | 6.3              | Sandy Loam      |
| 35                        | 2510.2                         | 40                           | 2505.2                            | 3.43            | 0.76          | 2.93              | 8.0       | 1.99           | 1.12 | 43.7                      | 87.5             | 8.7              | 3.8              | Sand            |
| 40                        | 2505.2                         | 45                           | 2500.2                            | 5.65            | 1.96          | 5.05              | 7.9       | 11.6           | 5.01 | 53.1                      | 72.5             | 18.7             | 8.8              | Sandy Loam      |
| 45                        | 2500.2                         | 50                           | 2495.2                            | 1.88            | 1.28          | 2.76              | 8.3       | 8.9            | 5.85 | 161                       | 16.3             | 46.2             | 37.5             | Silty Clay Loam |
| 50                        | 2495.2                         | 55                           | 2490.2                            | 1.75            | 1.36          | 2.8               | 8.4       | 9.64           | 6.39 | 128                       | 20               | 51.2             | 28.8             | Clay Loam       |
| 55                        | 2490.2                         | 60                           | 2485.2                            | 25.7            | 4.9           | 30                | 6.5       | 18.5           | 3.51 | 60.8                      | 70               | 15               | 15               | Sandy Loam      |
| 75                        | 2470.2                         | 80                           | 2465.2                            | 3.08            | 3.14          | 3.75              | 6.9       | 29.2           | 15.8 | 106                       | 87.5             | 11.2             | 1.3              | Sand            |
| 80                        | 2465.2                         | 85                           | 2460.2                            | 0.54            | 1.58          | 0.67              | 8.8       | 14.7           | 18.9 | 128                       | 20               | 60               | 20               | Silt Loam       |
| 85                        | 2460.2                         | 90                           | 2455.2                            | 0.48            | 1.46          | 0.6               | 8.8       | 13.7           | 18.7 | 159                       | 18.8             | 61.2             | 20               | Silt Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.46 | 0.35 | 0.6  | 6.5 | 0.32 | 0.23 | 43.7 | 16.3 | 8.7  | 1.3  |
| Average | 3.61 | 1.32 | 4.31 | 8.0 | 7.7  | 5.4  | 82.3 | 59   | 29   | 12   |
| Max     | 25.7 | 4.9  | 30   | 8.8 | 29.2 | 18.9 | 161  | 87.5 | 61.2 | 37.5 |
| Number  | 15   | 15   | 15   | 15  | 15   | 15   | 15   | 15   | 15   | 15   |

Depth to Coal: 60'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.46 | 0.35 | 1.18 | 6.5 | 0.32 | 0.23 | 43.7 | 16.3 | 8.7  | 1.3  |
| Average | 4.17 | 1.13 | 4.97 | 8.0 | 4.8  | 2.3  | 70.1 | 63   | 25   | 12   |
| Max     | 25.7 | 4.9  | 30   | 8.4 | 18.5 | 6.39 | 161  | 87.5 | 51.2 | 37.5 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12   | 12   | 12   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-27R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2533.8                         | 5                            | 2528.8                            | 26.1            | 2.69          | 14.7              | 7.3       | 6.56           | 1.45 | 84                        | 36.3             | 26.2             | 37.5             | Clay Loam       |
| 5                         | 2528.8                         | 10                           | 2523.8                            | 24.2            | 3.25          | 20.4              | 7.6       | 8.82           | 1.87 | 69.8                      | 36.3             | 22.4             | 41.3             | Clay            |
| 10                        | 2523.8                         | 15                           | 2518.8                            | 23.8            | 3.39          | 10.5              | 7.5       | 19.5           | 4.72 | 55                        | 56.3             | 19.9             | 23.8             | Sandy Clay Loam |
| 15                        | 2518.8                         | 20                           | 2513.8                            | 18              | 3.24          | 4.85              | 7.7       | 27.7           | 8.19 | 44.2                      | 71.3             | 16.2             | 12.5             | Sandy Loam      |
| 20                        | 2513.8                         | 25                           | 2508.8                            | 13.4            | 3.75          | 6.22              | 8.0       | 29.3           | 9.35 | 44.2                      | 86.3             | 11.2             | 2.5              | Sand            |
| 25                        | 2508.8                         | 30                           | 2503.8                            | 1.54            | 1.79          | 1.14              | 8.5       | 17.7           | 15.3 | 48.1                      | 88.8             | 9.9              | 1.3              | Sand            |
| 30                        | 2503.8                         | 35                           | 2498.8                            | 4.47            | 2.25          | 3.22              | 8.3       | 24.9           | 12.7 | 75.6                      | 71.3             | 18.7             | 10               | Sandy Loam      |
| 35                        | 2498.8                         | 40                           | 2493.8                            | 2.4             | 2.27          | 2.25              | 8.8       | 21.2           | 14   | 188                       | 31.3             | 37.4             | 31.3             | Clay Loam       |
| 40                        | 2493.8                         | 45                           | 2488.8                            | 1.6             | 2.38          | 1.99              | 8.7       | 27             | 20.1 | 138                       | 23.8             | 49.9             | 26.3             | Loam            |
| 45                        | 2488.8                         | 50                           | 2483.8                            | 1.21            | 2.25          | 1.66              | 8.7       | 27.6           | 23   | 115                       | 55               | 27.5             | 17.5             | Sandy Loam      |
| 50                        | 2483.8                         | 55                           | 2478.8                            | 1.15            | 2.23          | 1.55              | 9.0       | 30.5           | 26.3 | 87.5                      | 72.5             | 15               | 12.5             | Sandy Loam      |
| 55                        | 2478.8                         | 60                           | 2473.8                            | 0.74            | 3.28          | 1                 | 8.9       | 25.4           | 27.2 | 80.8                      | 76.3             | 13.7             | 10               | Sandy Loam      |
| 75                        | 2458.8                         | 80                           | 2453.8                            | 0.91            | 2.58          | 1.13              | 7.8       | 28.2           | 27.9 | 148                       | 48.8             | 27.4             | 23.8             | Sandy Clay Loam |
| 80                        | 2453.8                         | 85                           | 2448.8                            | 0.69            | 1.91          | 0.68              | 9.1       | 20.3           | 24.5 | 139                       | 22.5             | 62.5             | 15               | Silt Loam       |
| 85                        | 2448.8                         | 90                           | 2443.8                            |                 |               |                   | 9.3       |                |      | 103                       | 60               | 27.5             | 12.5             | Sandy Loam      |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.69 | 1.79 | 0.68 | 7.3 | 6.56 | 1.45 | 44.2 | 22.5 | 9.9  | 1.3  |
| Average | 8.59 | 2.66 | 5.09 | 8.3 | 22.5 | 15.5 | 94.7 | 56   | 26   | 19   |
| Max     | 26.1 | 3.75 | 20.4 | 9.3 | 30.5 | 27.9 | 188  | 88.8 | 62.5 | 41.3 |
| Number  | 14   | 14   | 14   | 15  | 14   | 14   | 15   | 15   | 15   | 15   |

Depth to Coal: 60'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.74 | 1.79 | 1    | 7.3 | 6.56 | 1.45 | 44.2 | 23.8 | 9.9  | 1.3  |
| Average | 9.88 | 2.73 | 5.79 | 8.3 | 22.2 | 13.7 | 85.9 | 59   | 22   | 19   |
| Max     | 26.1 | 3.75 | 20.4 | 9   | 30.5 | 27.2 | 188  | 88.8 | 49.9 | 41.3 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12   | 12   | 12   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.33

OVERBURDEN ANALYSIS DATA FOR SHOB-28R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2513.9                         | 5                            | 2508.9                            | 12              | 2.43          | 19.1              | 8.0       | 14.5           | 3.68 | 94.6                      | 10               | 41.2             | 48.8             | Silty Clay      |
| 5                         | 2508.9                         | 10                           | 2503.9                            | 22              | 4.14          | 31.2              | 8.1       | 31.1           | 6.02 | 93.5                      | 8.8              | 49.9             | 41.3             | Silty Clay      |
| 10                        | 2503.9                         | 15                           | 2498.9                            | 21              | 4.9           | 22.2              | 7.9       | 22             | 4.74 | 87.9                      | 15               | 45               | 40               | Silty Clay Loam |
| 15                        | 2498.9                         | 20                           | 2493.9                            | 24.3            | 4.6           | 23.7              | 7.9       | 21.1           | 4.31 | 64.4                      | 26.3             | 43.7             | 30               | Clay Loam       |
| 20                        | 2493.9                         | 25                           | 2488.9                            | 5.57            | 1.39          | 5.65              | 8.3       | 8.73           | 3.68 | 69.4                      | 28.8             | 58.7             | 12.5             | Silt Loam       |
| 25                        | 2488.9                         | 30                           | 2483.9                            | 2.92            | 0.79          | 2.06              | 8.4       | 3.31           | 2.1  | 57.7                      | 62.5             | 30               | 7.5              | Sandy Loam      |
| 30                        | 2483.9                         | 35                           | 2478.9                            | 4.75            | 0.95          | 3.09              | 8.3       | 2.88           | 1.45 | 52.5                      | 70               | 23.7             | 6.3              | Sandy Loam      |
| 35                        | 2478.9                         | 40                           | 2473.9                            | 5.87            | 1.06          | 3.53              | 8.0       | 2.38           | 1.1  | 45.4                      | 70               | 25               | 5                | Sandy Loam      |
| 40                        | 2473.9                         | 45                           | 2468.9                            | 19.8            | 2.97          | 13.5              | 7.7       | 8.28           | 2.03 | 53.1                      | 41.3             | 44.9             | 13.8             | Loam            |
| 45                        | 2468.9                         | 50                           | 2463.9                            | 3.39            | 0.72          | 2.47              | 8.1       | 1.38           | 0.81 | 46.4                      | 72.5             | 23.7             | 3.8              | Sandy Loam      |
| 50                        | 2463.9                         | 55                           | 2458.9                            | 2.79            | 0.64          | 2.27              | 8.1       | 1.23           | 0.77 | 48.5                      | 70               | 25               | 5                | Sandy Loam      |
| 55                        | 2458.9                         | 60                           | 2453.9                            | 2.41            | 0.56          | 2.06              | 8.0       | 1.11           | 0.75 | 60.5                      | 46.3             | 42.4             | 11.3             | Loam            |
| 60                        | 2453.9                         | 65                           | 2448.9                            | 3.98            | 0.95          | 3.68              | 8.0       | 2.41           | 1.23 | 63.1                      | 37.5             | 46.2             | 16.3             | Loam            |
| 65                        | 2448.9                         | 70                           | 2443.9                            | 7.88            | 1.67          | 7.39              | 7.9       | 4.73           | 1.71 | 40.2                      | 40               | 50               | 10               | Silt Loam       |
| 70                        | 2443.9                         | 75                           | 2438.9                            | 9.22            | 1.93          | 8.83              | 7.7       | 6.2            | 2.06 | 41.5                      | 81.3             | 14.9             | 3.8              | Loamy Sand      |
| 90                        | 2423.9                         | 95                           | 2418.9                            | 0.85            | 1.78          | 0.75              | 7.5       | 17.2           | 19.3 | 152                       | 46.3             | 28.7             | 25               | Loam            |
| 95                        | 2418.9                         | 100                          | 2413.9                            | 0.42            | 1.18          | 0.27              | 9.2       | 11.3           | 19.2 | 147                       | 10               | 57.5             | 32.5             | Silty Clay Loam |
| 100                       | 2413.9                         | 105                          | 2408.9                            | 0.29            | 1.13          | 0.24              | 9.0       | 11.2           | 21.9 | 172                       | 3.8              | 54.9             | 41.3             | Silty Clay      |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.29 | 0.56 | 0.24 | 7.5 | 1.11 | 0.75 | 40.2 | 3.8  | 14.9 | 3.8  |
| Average | 8.30 | 1.88 | 8.44 | 8.1 | 9.5  | 5.4  | 77.2 | 41   | 39   | 20   |
| Max     | 24.3 | 4.9  | 31.2 | 9.2 | 31.1 | 21.9 | 172  | 81.3 | 58.7 | 48.8 |
| Number  | 18   | 18   | 18   | 18  | 18   | 18   | 18   | 18   | 18   | 18   |

Depth to Coal: 75'

Statistical Summary Above Coal

|         |      |      |       |     |      |      |      |      |      |      |
|---------|------|------|-------|-----|------|------|------|------|------|------|
| Min     | 2.41 | 0.56 | 2.06  | 7.7 | 1.11 | 0.75 | 40.2 | 8.8  | 14.9 | 3.8  |
| Average | 9.86 | 1.98 | 10.05 | 8.0 | 8.8  | 2.4  | 61.2 | 45   | 38   | 17   |
| Max     | 24.3 | 4.9  | 31.2  | 8.4 | 31.1 | 6.02 | 94.6 | 81.3 | 58.7 | 48.8 |
| Number  | 15   | 15   | 15    | 15  | 15   | 15   | 15   | 15   | 15   | 15   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.34

OVERBURDEN ANALYSIS DATA FOR SHOB-29R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2508.7                         | 5                            | 2503.7                            | 2.76            | 0.54          | 2.65              | 7.7       | 0.76           | 0.46 | 49.6                      | 52.5             | 25               | 22.5             | Sandy Clay Loam |
| 5                         | 2503.7                         | 10                           | 2498.7                            | 0.44            | 0.38          | 2.89              | 9.0       | 0.98           | 0.76 | 100                       | 86.3             | 7.4              | 6.3              | Loamy Sand      |
| 10                        | 2498.7                         | 15                           | 2493.7                            | 0.73            | 0.58          | 2.47              | 8.7       | 2.16           | 1.71 | 46.9                      | 82.5             | 11.2             | 6.3              | Loamy Sand      |
| 15                        | 2493.7                         | 20                           | 2488.7                            | 0.47            | 0.57          | 0.97              | 8.9       | 4.28           | 5.04 | 42.4                      | 88.8             | 4.9              | 6.3              | Sand            |
| 20                        | 2488.7                         | 25                           | 2483.7                            | 0.39            | 0.42          | 0.62              | 9.0       | 3.31           | 4.67 | 33.8                      | 88.8             | 7.4              | 3.8              | Sand            |
| 25                        | 2483.7                         | 30                           | 2478.7                            | 1.1             | 0.88          | 1.12              | 8.2       | 5.44           | 5.16 | 81                        | 56.3             | 23.7             | 20               | Sandy Loam      |
| 30                        | 2478.7                         | 35                           | 2473.7                            | 1.01            | 0.7           | 1.01              | 8.5       | 6.9            | 6.87 | 128                       | 30               | 41.7             | 28.8             | Clay Loam       |
| 35                        | 2473.7                         | 40                           | 2468.7                            | 1.43            | 1.32          | 1.46              | 8.5       | 9.68           | 8.05 | 129                       | 27.5             | 46.2             | 26.3             | Loam            |
| 40                        | 2468.7                         | 45                           | 2463.7                            | 0.7             | 1.17          | 0.67              | 8.6       | 8.11           | 9.82 | 149                       | 25               | 37.5             | 37.5             | Clay Loam       |
| 45                        | 2463.7                         | 50                           | 2458.7                            | 0.92            | 1.07          | 1.04              | 8.7       | 14.1           | 14.3 | 124                       | 22.5             | 43.7             | 33.8             | Clay Loam       |
| 50                        | 2458.7                         | 55                           | 2453.7                            | 1.5             | 1.32          | 2                 | 7.8       | 18.6           | 14   | 115                       | 40               | 33.7             | 26.3             | Loam            |
| 70                        | 2438.7                         | 75                           | 2433.7                            | 0.27            | 0.74          | 0.22              | 9.2       | 8.04           | 16.2 | 150                       | 16.3             | 47.4             | 36.3             | Silty Clay Loam |
| 75                        | 2433.7                         | 80                           | 2428.7                            | 0.34            | 0.9           | 0.31              | 9.3       | 15.9           | 27.8 | 162                       | 10               | 43.7             | 46.3             | Silty Clay      |
| 80                        | 2428.7                         | 85                           | 2423.7                            | 0.35            | 1.62          | 0.4               | 9.5       | 21             | 34.4 | 166                       | 12.5             | 56.2             | 31.3             | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.27 | 0.38 | 0.22 | 7.7 | 0.76 | 0.46 | 33.8 | 10   | 4.9  | 3.8  |
| Average | 0.89 | 0.87 | 1.27 | 8.7 | 8.52 | 10.7 | 105  | 46   | 31   | 24   |
| Max     | 2.76 | 1.62 | 2.89 | 9.5 | 21   | 34.4 | 166  | 88.8 | 56.2 | 46.3 |
| Number  | 14   | 14   | 14   | 14  | 14   | 14   | 14   | 14   | 14   | 14   |

Depth to Coal: 53'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.39 | 0.38 | 0.62 | 7.7 | 0.76 | 0.46 | 33.8 | 22.5 | 4.9  | 3.8  |
| Average | 1.04 | 0.81 | 1.54 | 8.5 | 6.76 | 6.44 | 90.8 | 55   | 26   | 20   |
| Max     | 2.76 | 1.32 | 2.89 | 9   | 18.6 | 14.3 | 149  | 88.8 | 46.2 | 37.5 |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11   | 11   | 11   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.35

OVERBURDEN ANALYSIS DATA FOR SHOB-30C

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 2                         | 2518.3                         | 7                            | 2511.3                            | 23.1            | 8.75          | 67.4              | 8.0       | 51.7           | 7.68 | 66.1                      | 23.8             | 53.7             | 22.5             | Clay            |
| 9.5                       | 2508.8                         | 14.5                         | 2503.8                            | 24.5            | 6.8           | 41.2              | 7.2       | 36.3           | 6.33 | 82.2                      | 6.3              | 56.2             | 37.5             | Silt Loam       |
| 16                        | 2502.3                         | 21                           | 2497.3                            | 18.4            | 3.78          | 18.3              | 7.3       | 15.9           | 3.7  | 84.2                      | 8.8              | 59.9             | 31.3             | Silt Loam       |
| 21                        | 2497.3                         | 26                           | 2492.3                            | 5.54            | 2.57          | 7.26              | 7.6       | 16.4           | 6.47 | 87.1                      | 12.5             | 61.2             | 26.3             | Silty Clay Loam |
| 26                        | 2492.3                         | 30                           | 2488.3                            | 3.97            | 2.54          | 5.56              | 7.9       | 19.8           | 9.06 | 123                       | 10               | 57.5             | 32.5             | Silt Loam       |
| 30                        | 2488.3                         | 32.5                         | 2485.8                            | 0.94            | 1.2           | 1.01              | 8.4       | 10.5           | 10.6 | 151                       | 6.3              | 61.2             | 32.5             | Silty Clay Loam |
| 32                        | 2486.3                         | 35                           | 2483.3                            | 1.17            | 1.63          | 1.52              | 8.3       | 14.9           | 12.8 | 194                       | 1.3              | 41.2             | 57.5             | Silty Clay Loam |
| 35                        | 2483.3                         | 40                           | 2478.3                            | 1.09            | 1.95          | 1.45              | 8.6       | 18.3           | 16.2 | 98.9                      | 38.8             | 41.2             | 20               | Clay            |
| 40                        | 2478.3                         | 42.7                         | 2475.6                            | 0.99            | 1.98          | 0.91              | 8.9       | 19.8           | 20.3 | 66.3                      | 66.3             | 19.9             | 13.8             | Sandy Loam      |
| 45                        | 2473.3                         | 50                           | 2468.3                            | 0.83            | 1.52          | 0.55              | 8.7       | 14.5           | 17.5 | 66.4                      | 60               | 22.5             | 17.5             | Sandy Loam      |
| 50                        | 2468.3                         | 53                           | 2465.3                            | 0.6             | 0.98          | 0.35              | 9.2       | 10             | 14.6 | 91.1                      | 62.5             | 16.2             | 21.3             | Sandy Clay Loam |
| 75                        | 2443.3                         | 80                           | 2438.3                            | 0.57            | 0.96          | 0.33              | 8.2       | 10             | 14.9 | 159                       | 6.3              | 23.7             | 70               | Clay            |
| 80                        | 2438.3                         | 85                           | 2433.3                            | 1.15            | 1.71          | 0.71              | 8.5       | 16.3           | 16.9 | 194                       | 5                | 51.2             | 43.8             | Silty Clay      |
| 85                        | 2433.3                         | 90                           | 2428.3                            | 0.59            | 1.6           | 0.41              | 8.3       | 16.5           | 23.4 | 155                       | 20               | 36.2             | 43.8             | Clay            |
| 90                        | 2428.3                         | 95                           | 2423.3                            | 0.6             | 1.51          | 0.44              | 8.7       | 17             | 23.5 | 136                       | 10               | 56.2             | 33.8             | Silty Clay Loam |
| 95                        | 2423.3                         | 100                          | 2418.3                            | 0.83            | 1.54          | 0.68              | 8.9       | 14.6           | 16.8 | 124                       | 31.3             | 46.2             | 22.5             | Loam            |
| 100                       | 2418.3                         | 105                          | 2413.3                            | 0.77            | 1.34          | 0.56              | 9.0       | 15.4           | 18.9 | 152                       | 10               | 60               | 30               | Silty Clay Loam |
| 105                       | 2413.3                         | 110                          | 2408.3                            | 0.26            | 1.43          | 0.35              | 9.0       | 15.3           | 27.7 | 151                       | 6.3              | 49.9             | 43.8             | Silty Clay      |
| 110                       | 2408.3                         | 115                          | 2403.3                            | 0.68            | 2.23          | 0.51              | 8.7       | 26.5           | 34.3 | 154                       | 8.8              | 59.9             | 31.3             | Silty Clay Loam |
| 115                       | 2403.3                         | 120                          | 2398.3                            | 0.64            | 2.02          | 0.59              | 8.7       | 22.6           | 28.8 | 93.6                      | 35               | 45               | 20               | Loam            |
| 120                       | 2398.3                         | 125                          | 2393.3                            | 2.5             | 6.22          | 3.76              | 8.7       | 74.6           | 42.2 | 58.5                      | 70               | 21.2             | 8.8              | Sandy Loam      |
| 125                       | 2393.3                         | 130                          | 2388.3                            | 3.04            | 3.55          | 2.92              | 8.3       | 37.5           | 21.7 | 41.5                      | 71.3             | 22.4             | 6.3              | Sandy Loam      |
| 130                       | 2388.3                         | 135                          | 2383.3                            | 6.18            | 4.85          | 4.92              | 7.9       | 48.9           | 20.7 | 40.8                      | 71.3             | 22.4             | 6.3              | Sandy Loam      |
| 135                       | 2383.3                         | 140                          | 2378.3                            | 0.74            | 3.02          | 0.85              | 8.6       | 32.9           | 36.8 | 44.5                      | 86.3             | 8.7              | 5                | Loamy Sand      |
| 140                       | 2378.3                         | 145                          | 2373.3                            | 23.9            | 6.32          | 22.4              | 7.7       | 48.7           | 10.1 | 61.2                      | 50               | 31.2             | 18.8             | Loam            |
| 145                       | 2373.3                         | 150                          | 2368.3                            | 10              | 5.39          | 10.1              | 7.8       | 52.8           | 16.6 | 68.7                      | 50               | 30               | 20               | Loam            |
| 150                       | 2368.3                         | 155                          | 2363.3                            | 1.05            | 3.36          | 1.1               | 8.8       | 36             | 34.7 | 42.1                      | 86.3             | 8.7              | 5                | Loamy Sand      |
| 155                       | 2363.3                         | 160                          | 2358.3                            | 0.55            | 2.18          | 0.57              | 9.1       | 22.9           | 30.5 | 53                        | 78.8             | 17.4             | 3.8              | Loamy Sand      |
| 160                       | 2358.3                         | 165                          | 2353.3                            | 2.03            | 3.02          | 2.36              | 8.4       | 28.8           | 19.4 | 68.6                      | 67.5             | 22.5             | 10               | Sandy Loam      |
| 165                       | 2353.3                         | 170                          | 2348.3                            | 0.7             | 2.46          | 0.58              | 9.1       | 27.8           | 34.9 | 88.8                      | 35               | 46.2             | 18.8             | Loam            |
| 170                       | 2348.3                         | 175                          | 2343.3                            | 0.3             | 1.51          | 0.2               | 8.9       | 14.8           | 29.6 | 110                       | 23.8             | 47.4             | 28.8             | Clay Loam       |
| 175                       | 2343.3                         | 180                          | 2338.3                            | 0.38            | 1.93          | 0.25              | 9.3       | 18.4           | 32.9 | 113                       | 7.5              | 50               | 42.5             | Silty Clay      |
| 180                       | 2338.3                         | 185                          | 2333.3                            | 0.88            | 3.04          | 0.73              | 8.7       | 30.8           | 34.3 | 112                       | 8.8              | 44.9             | 46.3             | Silty Clay      |
| 185                       | 2333.3                         | 190                          | 2328.3                            | 0.8             | 3.33          | 0.67              | 8.5       | 39.5           | 46   | 131                       | 10               | 32.5             | 57.5             | Clay            |
| 190                       | 2328.3                         | 195                          | 2323.3                            | 0.44            | 2.23          | 0.34              | 7.8       | 23.6           | 37.8 | 120                       | 37.5             | 17.5             | 45               | Clay            |
| 195                       | 2323.3                         | 200                          | 2318.3                            | 1.06            | 4.4           | 1.13              | 7.0       | 45.8           | 43.8 | 105                       | 85               | 5                | 10               | Loamy Sand      |
| 200                       | 2318.3                         | 205                          | 2313.3                            | 1.03            | 2.8           | 1.3               | 7.7       | 29             | 26.8 | 97.4                      | 45               | 38.7             | 16.3             | Loam            |
| 205                       | 2313.3                         | 210                          | 2308.3                            | 0.62            | 2.55          | 0.54              | 8.0       | 27             | 35.4 | 114                       | 37.5             | 33.7             | 28.8             | Clay Loam       |
| 210                       | 2308.3                         | 215                          | 2303.3                            | 0.57            | 1.75          | 0.36              | 9.7       | 20.9           | 30.6 | 117                       | 27.5             | 47.5             | 25               | Loam            |
| 215                       | 2303.3                         | 220                          | 2298.3                            | 0.41            | 2.06          | 0.33              | 8.9       | 21.4           | 35.2 | 125                       | 30               | 41.2             | 28.8             | Clay Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |     |
|---------|------|------|------|-----|------|------|------|------|------|-----|
| Min     | 0.26 | 0.96 | 0.2  | 7   | 10   | 3.7  | 40.8 | 1.3  | 5    | 3.8 |
| Average | 3.61 | 2.85 | 5.14 | 8.4 | 26.6 | 23.8 | 104  | 35   | 38   | 27  |
| Max     | 24.5 | 8.75 | 67.4 | 9.7 | 74.6 | 46   | 194  | 86.3 | 61.2 | 70  |
| Number  | 40   | 40   | 40   | 40  | 40   | 40   | 40   | 40   | 40   | 40  |

Depth to Coal: 53.2'

Statistical Summary Above Coal

|         |      |      |       |     |      |      |      |      |      |      |
|---------|------|------|-------|-----|------|------|------|------|------|------|
| Min     | 0.6  | 0.98 | 0.35  | 7.2 | 10   | 3.7  | 66.1 | 1.3  | 16.2 | 13.8 |
| Average | 7.38 | 3.06 | 13.23 | 8.2 | 20.7 | 11.4 | 101  | 27   | 45   | 28   |
| Max     | 24.5 | 8.75 | 67.4  | 9.2 | 51.7 | 20.3 | 194  | 66.3 | 61.2 | 57.5 |
| Number  | 11   | 11   | 11    | 11  | 11   | 11   | 11   | 11   | 11   | 11   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-31R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2617.8                         | 5                            | 2612.8                            | 22.6            | 8.28          | 27.4              | 8.0       | 58.6           | 11.7 | 130                       | 8.8              | 44.9             | 46.3             | Silty Clay      |
| 5                         | 2612.8                         | 10                           | 2607.8                            | 0.91            | 2.77          | 1.65              | 8.5       | 27.2           | 24.1 | 173                       | 13.8             | 58.7             | 27.5             | Silty Clay Loam |
| 10                        | 2607.8                         | 15                           | 2602.8                            | 1.57            | 3.37          | 2.59              | 8.4       | 30.9           | 21.5 | 164                       | 12.5             | 56.2             | 31.3             | Silty Clay Loam |
| 15                        | 2602.8                         | 20                           | 2597.8                            | 16.2            | 6.82          | 15.4              | 7.2       | 57.2           | 14.4 | 99.8                      | 7.5              | 63.7             | 28.8             | Silty Clay Loam |
| 20                        | 2597.8                         | 25                           | 2592.8                            | 19.9            | 14.2          | 39.3              | 5.5       | 142            | 26.1 | 85.9                      | 72.5             | 12.5             | 15               | Sandy Loam      |
| 25                        | 2592.8                         | 30                           | 2587.8                            | 0.57            | 2.96          | 0.67              | 8.8       | 29.1           | 37   | 160                       | 22.5             | 37.5             | 40               | Clay Loam       |
| 30                        | 2587.8                         | 35                           | 2582.8                            | 0.57            | 2.31          | 0.49              | 8.1       | 22             | 30.2 | 109                       | 45               | 30               | 25               | Loam            |
| 35                        | 2582.8                         | 40                           | 2577.8                            | 0.31            | 1.64          | 0.22              | 9.0       | 15.1           | 29.4 | 130                       | 10               | 58.7             | 31.3             | Silty Clay Loam |
| 40                        | 2577.8                         | 45                           | 2572.8                            | 0.49            | 2.02          | 0.32              | 8.8       | 20.8           | 32.7 | 107                       | 7.5              | 60               | 32.5             | Silty Clay Loam |
| 45                        | 2572.8                         | 50                           | 2567.8                            | 0.42            | 2.32          | 0.37              | 7.8       | 23.4           | 37.2 | 103                       | 20               | 47.5             | 32.5             | Silty Clay Loam |
| 50                        | 2567.8                         | 55                           | 2562.8                            | 0.3             | 1.35          | 0.23              | 8.7       | 12.6           | 24.5 | 72.4                      | 17.5             | 56.2             | 26.3             | Silt Loam       |
| 55                        | 2562.8                         | 60                           | 2557.8                            | 0.29            | 1.15          | 0.24              | 9.2       | 10.4           | 20.3 | 75.3                      | 7.5              | 67.5             | 25               | Silt Loam       |
| 60                        | 2557.8                         | 65                           | 2552.8                            | 0.46            | 1.67          | 0.38              | 9.3       | 16.4           | 25.4 | 74.8                      | 10               | 68.7             | 21.3             | Silt Loam       |
| 65                        | 2552.8                         | 70                           | 2547.8                            | 0.35            | 1.32          | 0.29              | 9.0       | 11.8           | 21   | 58.8                      | 12.5             | 70               | 17.5             | Silt Loam       |
| 70                        | 2547.8                         | 75                           | 2542.8                            | 0.26            | 1.6           | 0.21              | 9.0       | 14.8           | 30.6 | 21.6                      | 57.5             | 31.2             | 11.3             | Sandy Loam      |
| 75                        | 2542.8                         | 80                           | 2537.8                            | 0.6             | 1.94          | 0.45              | 9.0       | 18.6           | 25.7 | 56.7                      | 32.5             | 51.2             | 16.3             | Silt Loam       |
| 80                        | 2537.8                         | 85                           | 2532.8                            | 0.5             | 1.91          | 0.37              | 8.7       | 17.9           | 27   | 46.6                      | 50               | 40               | 10               | Loam            |
| 85                        | 2532.8                         | 90                           | 2527.8                            | 0.47            | 1.63          | 0.38              | 9.1       | 14.9           | 22.9 | 53.5                      | 50               | 38.7             | 11.3             | Loam            |
| 90                        | 2527.8                         | 95                           | 2522.8                            | 0.53            | 1.91          | 0.41              | 8.9       | 18.1           | 26.4 | 43                        | 61.3             | 29.9             | 8.8              | Sandy Loam      |
| 95                        | 2522.8                         | 100                          | 2517.8                            | 0.54            | 1.72          | 0.39              | 9.0       | 16.2           | 23.8 | 46.1                      | 57.5             | 31.2             | 11.3             | Sandy Loam      |
| 100                       | 2517.8                         | 105                          | 2512.8                            | 0.39            | 1.27          | 0.29              | 9.1       | 11.6           | 19.8 | 31.8                      | 65               | 27.5             | 7.5              | Sandy Loam      |
| 105                       | 2512.8                         | 110                          | 2507.8                            | 0.51            | 1.67          | 0.34              | 9.0       | 15.8           | 24.1 | 57                        | 40               | 46.2             | 13.8             | Loam            |
| 110                       | 2507.8                         | 115                          | 2502.8                            | 0.36            | 0.93          | 0.67              | 9.2       | 8.56           | 11.9 | 61.7                      | 60               | 28.7             | 11.3             | Sandy Loam      |
| 115                       | 2502.8                         | 120                          | 2497.8                            | 0.61            | 1.56          | 0.45              | 9.0       | 15.2           | 20.9 | 71.7                      | 32.5             | 50               | 17.5             | Silt Loam       |
| 135                       | 2482.8                         | 140                          | 2477.8                            | 0.4             | 2.4           | 0.4               | 7.7       | 25.5           | 40.4 | 135                       | 52.5             | 20               | 27.5             | Sandy Clay Loam |
| 140                       | 2477.8                         | 145                          | 2472.8                            | 0.34            | 1.56          | 0.23              | 9.3       | 14.7           | 27.5 | 158                       | 17.5             | 55               | 27.5             | Silty Clay Loam |
| 145                       | 2472.8                         | 150                          | 2467.8                            | 0.23            | 1.44          | 0.14              | 9.3       | 13             | 30.4 | 131                       | 40               | 42.5             | 17.5             | Loam            |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.23 | 0.93 | 0.14 | 5.5 | 8.56 | 11.7 | 21.6 | 7.5  | 12.5 | 7.5  |
| Average | 2.62 | 2.73 | 3.49 | 8.6 | 25.3 | 25.4 | 91.0 | 33   | 45   | 22   |
| Max     | 22.6 | 14.2 | 39.3 | 9.3 | 142  | 40.4 | 173  | 72.5 | 70   | 46.3 |
| Number  | 27   | 27   | 27   | 27  | 27   | 27   | 27   | 27   | 27   | 27   |

Depth to Coal: 119'

Statistical Summary Above Coal

|         |      |      |      |     |       |      |      |      |      |      |
|---------|------|------|------|-----|-------|------|------|------|------|------|
| Min     | 0.26 | 0.93 | 0.21 | 5.5 | 8.56  | 11.7 | 21.6 | 7.5  | 12.5 | 7.5  |
| Average | 2.90 | 2.85 | 3.90 | 8.6 | 26.22 | 24.5 | 84.7 | 32   | 46   | 22   |
| Max     | 22.6 | 14.2 | 39.3 | 9.3 | 142   | 37.2 | 173  | 72.5 | 70   | 46.3 |
| Number  | 24   | 24   | 24   | 24  | 24    | 24   | 24   | 24   | 24   | 24   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-32R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2602.2                         | 5                            | 2597.2                            | 21.7            | 6.39          | 37.5              | 7.9       | 38.6           | 7.1  | 146                       | 6.3              | 29.9             | 63.8             | Clay            |
| 5                         | 2597.2                         | 10                           | 2592.2                            | 21.4            | 9.33          | 62.6              | 7.6       | 70.6           | 10.9 | 144                       | 15               | 33.7             | 51.3             | Clay            |
| 10                        | 2592.2                         | 15                           | 2587.2                            | 19.5            | 8             | 50.1              | 7         | 53.6           | 9.09 | 134                       | 5                | 32.5             | 62.5             | Clay            |
| 15                        | 2587.2                         | 20                           | 2582.2                            | 10.1            | 5.1           | 22.7              | 7.5       | 34.4           | 8.48 | 130                       | 12.5             | 28.7             | 58.8             | Clay            |
| 20                        | 2582.2                         | 25                           | 2577.2                            | 1.75            | 2.34          | 3.03              | 8.2       | 19.2           | 12.4 | 158                       | 15               | 58.7             | 26.3             | Silt Loam       |
| 25                        | 2577.2                         | 30                           | 2572.2                            | 2.52            | 3.4           | 3.18              | 7         | 34.2           | 20.3 | 131                       | 41.3             | 18.7             | 40               | Clay            |
| 30                        | 2572.2                         | 35                           | 2567.2                            | 0.57            | 3.57          | 0.67              | 8.7       | 19.1           | 24.2 | 164                       | 11.3             | 38.7             | 50               | Clay            |
| 35                        | 2567.2                         | 40                           | 2562.2                            | 0.91            | 2.22          | 1.11              | 8.2       | 22.3           | 22.2 | 158                       | 18.8             | 42.4             | 38.8             | Silty Clay Loam |
| 40                        | 2562.2                         | 45                           | 2557.2                            | 0.32            | 1.43          | 0.42              | 8.8       | 12.7           | 21   | 128                       | 13.8             | 63.7             | 22.5             | Silt Loam       |
| 45                        | 2557.2                         | 50                           | 2552.2                            | 1.44            | 2.52          | 1.97              | 7.3       | 24.1           | 18.4 | 124                       | 21.3             | 54.9             | 23.8             | Silt Loam       |
| 50                        | 2552.2                         | 55                           | 2547.2                            | 0.69            | 1.92          | 0.94              | 8.5       | 19.2           | 21.2 | 80.2                      | 18.8             | 59.9             | 21.3             | Silt Loam       |
| 55                        | 2547.2                         | 60                           | 2542.2                            | 0.34            | 1.63          | 0.4               | 8.8       | 16.1           | 26.4 | 80                        | 11.3             | 63.7             | 25               | Silt Loam       |
| 60                        | 2542.2                         | 65                           | 2537.2                            | 0.52            | 1.76          | 0.54              | 8.7       | 17.3           | 23.8 | 73                        | 26.3             | 43.7             | 30               | Clay Loam       |
| 65                        | 2537.2                         | 70                           | 2532.2                            | 0.46            | 1.91          | 0.57              | 8.8       | 19             | 26.4 | 80                        | 11.3             | 62.4             | 26.3             | Silt Loam       |
| 70                        | 2532.2                         | 75                           | 2527.2                            | 0.3             | 1.56          | 0.37              | 9.0       | 14.4           | 24.7 | 78.6                      | 31.3             | 43.7             | 25               | Loam            |
| 75                        | 2527.2                         | 80                           | 2522.2                            | 0.49            | 1.93          | 0.48              | 8.9       | 18.4           | 26.4 | 96.3                      | 11.3             | 58.7             | 30               | Silty Clay Loam |
| 80                        | 2522.2                         | 85                           | 2517.2                            | 0.41            | 2.26          | 0.54              | 8.7       | 22.7           | 32.9 | 103                       | 3.8              | 56.2             | 40               | Silty Clay Loam |
| 85                        | 2517.2                         | 90                           | 2512.2                            | 0.41            | 2.11          | 0.4               | 8.6       | 21.9           | 34.5 | 121                       | 26.3             | 48.7             | 25               | Loam            |
| 90                        | 2512.2                         | 95                           | 2507.2                            | 0.46            | 1.06          | 0.27              | 8.9       | 10.4           | 17.3 | 147                       | 13.8             | 54.9             | 31.3             | Silty Clay Loam |
| 95                        | 2507.2                         | 100                          | 2502.2                            | 0.21            | 1.29          | 0.23              | 9.2       | 13.3           | 28.5 | 146                       | 22.5             | 52.5             | 25               | Silt Loam       |
| 100                       | 2502.2                         | 105                          | 2497.2                            | 0.33            | 1.68          | 0.32              | 9.3       | 17.6           | 30.9 | 125                       | 58.8             | 18.7             | 22.5             | Sandy Clay Loam |
| 105                       | 2497.2                         | 110                          | 2492.2                            | 0.05            | 1.52          | <0.08             | 9.3       | 3.22           | 13.7 | 133                       | 42.5             | 33.7             | 23.8             | Loam            |
| 110                       | 2492.2                         | 115                          | 2487.2                            | 0.05            | 1.2           | <0.08             | 9.3       | 2.58           | 11.8 | 112                       | 65               | 13.7             | 21.3             | Sandy Clay Loam |
| 115                       | 2487.2                         | 120                          | 2482.2                            | 0.05            | 1.34          | <0.08             | 9.2       | 2.62           | 11.5 | 106                       | 68.8             | 13.7             | 17.5             | Sandy Loam      |
| 120                       | 2482.2                         | 125                          | 2477.2                            | 0.13            | 3.07          | 0.16              | 7.2       | 6.69           | 17.8 | 94.1                      | 78.8             | 11.2             | 10               | Sandy Loam      |
| 145                       | 2457.2                         | 150                          | 2452.2                            | 0.07            | 1.9           | <0.08             | 8.5       | 4.1            | 15.2 | 141                       | 23.8             | 43.7             | 32.5             | Clay Loam       |
| 150                       | 2452.2                         | 155                          | 2447.2                            | 0.05            | 1.93          | <0.08             | 8.8       | 4.66           | 18.7 | 96.6                      | 50               | 35               | 15               | Loam            |

Statistical Summary

|         |      |      |       |     |      |      |     |      |      |      |
|---------|------|------|-------|-----|------|------|-----|------|------|------|
| Min     | 0.05 | 1.06 | <0.08 | 7   | 2.58 | 7.1  | 73  | 3.8  | 11.2 | 10   |
| Average | 3.16 | 2.75 | 6.99  | 8.4 | 20.1 | 19.8 | 120 | 27   | 41   | 32   |
| Max     | 21.7 | 9.33 | 62.6  | 9.3 | 70.6 | 34.5 | 164 | 78.8 | 63.7 | 63.8 |
| Number  | 27   | 27   | 27    | 27  | 27   | 27   | 27  | 27   | 27   | 27   |

Depth to Coal: 125'

Statistical Summary Above Coal

|         |      |      |       |     |      |      |     |      |      |      |
|---------|------|------|-------|-----|------|------|-----|------|------|------|
| Min     | 0.05 | 1.06 | <0.08 | 7   | 2.58 | 7.1  | 73  | 3.8  | 13.7 | 17.5 |
| Average | 3.40 | 2.82 | 7.54  | 8.4 | 21.4 | 20.1 | 120 | 24   | 43   | 33   |
| Max     | 21.7 | 9.33 | 62.6  | 9.3 | 70.6 | 34.5 | 164 | 68.8 | 63.7 | 63.8 |
| Number  | 25   | 25   | 25    | 25  | 25   | 25   | 25  | 24   | 24   | 24   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- In calculating arithmetic mean < 0.08 is 0.04
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-33R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2534.1                         | 5                            | 2529.1                            | 5.52            | 2.94          | 10.1              | 7.6       | 21.9           | 7.85 | 78.2                      | 27.5             | 32.5             | 40               | Clay Loam       |
| 5                         | 2529.1                         | 10                           | 2524.1                            | 5.37            | 8.26          | 28.6              | 8.6       | 80.7           | 19.6 | 56.6                      | 48.8             | 39.9             | 11.3             | Loam            |
| 10                        | 2524.1                         | 15                           | 2519.1                            | 11.3            | 6.65          | 17.4              | 8.1       | 59             | 15.6 | 77.5                      | 18.8             | 58.7             | 22.5             | Silt Loam       |
| 15                        | 2519.1                         | 20                           | 2514.1                            | 2.15            | 2.85          | 3.39              | 8.3       | 24.1           | 14.5 | 166                       | 8.8              | 68.7             | 22.5             | Silt Loam       |
| 20                        | 2514.1                         | 25                           | 2509.1                            | 0.82            | 2.71          | 1.34              | 8.6       | 24.6           | 23.6 | 195                       | 5                | 57.5             | 37.5             | Silty Clay Loam |
| 25                        | 2509.1                         | 30                           | 2504.1                            | 0.39            | 1.37          | 0.62              | 8.4       | 13             | 18.3 | 174                       | 42.5             | 26.2             | 31.3             | Clay Loam       |
| 30                        | 2504.1                         | 35                           | 2499.1                            | 2.2             | 3.79          | 3.19              | 8.4       | 36.8           | 22.4 | 108                       | 73.8             | 9.9              | 16.3             | Sandy Loam      |
| 35                        | 2499.1                         | 40                           | 2494.1                            | 1.17            | 3.02          | 1.41              | 8.4       | 30.7           | 27   | 125                       | 62.5             | 15               | 22.5             | Sandy Clay Loam |
| 40                        | 2494.1                         | 45                           | 2489.1                            | 1.55            | 5.54          | 2.16              | 7.1       | 62.2           | 45.7 | 87.8                      | 77.5             | 12.5             | 10               | Sandy Loam      |
| 60                        | 2474.1                         | 65                           | 2469.1                            | 0.44            | 2.64          | 0.52              | 7.8       | 29.1           | 42   | 133                       | 27.5             | 43.7             | 28.8             | Clay Loam       |
| 65                        | 2469.1                         | 70                           | 2464.1                            | 0.36            | 1.61          | 0.34              | 9.0       | 17.2           | 29.2 | 149                       | 10               | 65               | 25               | Silt Loam       |
| 70                        | 2464.1                         | 75                           | 2459.1                            | 0.26            | 1.33          | 0.29              | 9.1       | 14.1           | 26.8 | 102                       | 22.5             | 60               | 17.5             | Silt Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |    |
|---------|------|------|------|-----|------|------|------|------|------|----|
| Min     | 0.26 | 1.33 | 0.29 | 7.1 | 13   | 7.85 | 56.6 | 5    | 9.9  | 10 |
| Average | 2.63 | 3.56 | 5.78 | 8.3 | 34.5 | 24.4 | 121  | 35   | 41   | 24 |
| Max     | 11.3 | 8.26 | 28.6 | 9.1 | 80.7 | 45.7 | 195  | 77.5 | 68.7 | 40 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12   | 12   | 12 |

Depth to Coal: 44'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |    |
|---------|------|------|------|-----|------|------|------|------|------|----|
| Min     | 0.39 | 1.37 | 0.62 | 7.1 | 13   | 7.85 | 56.6 | 5    | 9.9  | 10 |
| Average | 3.39 | 4.13 | 7.58 | 8.2 | 39.2 | 21.6 | 119  | 41   | 36   | 24 |
| Max     | 11.3 | 8.26 | 28.6 | 8.6 | 80.7 | 45.7 | 195  | 77.5 | 68.7 | 40 |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9    | 9    | 9  |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.39

OVERBURDEN ANALYSIS DATA FOR SHOB-34R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2516.9                         | 5                            | 2511.9                            | 2.59            | 0.65          | 2.67              | 7.6       | 1.76           | 1.08 | 73                        | 18.8             | 41.2             | 40               | Silty Clay Loam |
| 5                         | 2511.9                         | 10                           | 2506.9                            | 1.42            | 0.77          | 2.6               | 8.3       | 4.01           | 2.83 | 76.9                      | 16.3             | 56.2             | 27.5             | Silty Clay Loam |
| 10                        | 2506.9                         | 15                           | 2501.9                            | 0.8             | 0.53          | 1.44              | 8.6       | 3.11           | 2.93 | 47.8                      | 58.8             | 33.7             | 7.5              | Sandy Loam      |
| 15                        | 2501.9                         | 20                           | 2496.9                            | 1.41            | 1             | 1.6               | 8.3       | 7.2            | 5.88 | 90.9                      | 10               | 61.2             | 28.8             | Silty Clay Loam |
| 20                        | 2496.9                         | 25                           | 2491.9                            | 1.75            | 1.69          | 1.67              | 8.2       | 13.8           | 10.6 | 104                       | 33.8             | 41.2             | 25               | Loam            |
| 25                        | 2491.9                         | 30                           | 2486.9                            | 1.03            | 1.59          | 0.94              | 8.1       | 15.2           | 15.3 | 117                       | 11.3             | 53.7             | 35               | Silty Clay Loam |
| 30                        | 2486.9                         | 35                           | 2481.9                            | 1.2             | 2.26          | 1.31              | 8.6       | 22.1           | 19.7 | 147                       | 16.3             | 56.2             | 27.5             | Silty Clay Loam |
| 35                        | 2481.9                         | 40                           | 2476.9                            | 0.7             | 1.82          | 0.82              | 8.7       | 18.3           | 21   | 170                       | 16.3             | 42.4             | 41.3             | Silty Clay      |
| 40                        | 2476.9                         | 45                           | 2471.9                            | 0.62            | 1.93          | 0.55              | 9.2       | 20.4           | 26.7 | 106                       | 63.8             | 12.4             | 23.8             | Sandy Clay Loam |
| 45                        | 2471.9                         | 50                           | 2466.9                            | 0.43            | 1.36          | 0.39              | 9.1       | 13.3           | 20.8 | 97.6                      | 61.3             | 18.7             | 20               | Sandy Loam      |
| 50                        | 2466.9                         | 55                           | 2461.9                            | 0.95            | 1.84          | 0.71              | 9.2       | 21             | 23   | 53.5                      | 61.3             | 18.7             | 20               | Sandy Loam      |
| 75                        | 2441.9                         | 80                           | 2436.9                            | 0.25            | 0.8           | 0.19              | 9.3       | 8.46           | 17.9 | 169                       | 13.8             | 48.7             | 37.5             | Silty Clay Loam |
| 80                        | 2436.9                         | 85                           | 2431.9                            | 0.66            | 2.24          | 0.68              | 8.8       | 26             | 31.7 | 103                       | 30               | 50               | 20               | Silt Loam       |
| 85                        | 2431.9                         | 90                           | 2426.9                            | 0.64            | 3.62          | 0.9               | 9.2       | 41.9           | 47.7 | 57.5                      | 82.5             | 8.7              | 8.8              | Loamy Sand      |
| 90                        | 2426.9                         | 95                           | 2421.9                            | 0.4             | 2.98          | 0.59              | 9.4       | 34             | 48.3 | 52.6                      | 83.8             | 7.4              | 8.8              | Loamy Sand      |
| 95                        | 2421.9                         | 100                          | 2416.9                            | 0.39            | 2.79          | 0.6               | 9.5       | 31.8           | 45.2 | 43.3                      | 90               | 3.7              | 6.3              | Sand            |
| 100                       | 2416.9                         | 105                          | 2411.9                            | 0.49            | 2.69          | 0.64              | 8.9       | 31.2           | 41.7 | 65.2                      | 75               | 13.7             | 11.3             | Sandy Loam      |
| 105                       | 2411.9                         | 110                          | 2406.9                            | 0.44            | 2.42          | 0.51              | 9.0       | 28.8           | 41.8 | 41                        | 88.8             | 4.9              | 6.3              | Sand            |
| 110                       | 2406.9                         | 115                          | 2401.9                            | 0.43            | 2.4           | 0.46              | 9.7       | 29.9           | 45   | 46.9                      | 88.8             | 4.9              | 6.3              | Sand            |
| 115                       | 2401.9                         | 120                          | 2396.9                            | 0.71            | 2.24          | 0.7               | 9.0       | 27.4           | 32.7 | 39.8                      | 85               | 11.2             | 3.8              | Loamy Sand      |
| 120                       | 2396.9                         | 125                          | 2391.9                            | 0.89            | 2.31          | 0.8               | 9.1       | 30.1           | 32.8 | 50.8                      | 76.3             | 14.9             | 8.8              | Sandy Loam      |
| 125                       | 2391.9                         | 130                          | 2386.9                            | 0.56            | 1.68          | 0.55              | 8.8       | 18.7           | 25.1 | 41.2                      | 77.5             | 13.7             | 8.8              | Sandy Loam      |
| 130                       | 2386.9                         | 135                          | 2381.9                            | 0.65            | 1.78          | 0.56              | 8.8       | 21.2           | 27.3 | 40.7                      | 82.5             | 10               | 7.5              | Loamy Sand      |
| 135                       | 2381.9                         | 140                          | 2376.9                            | 0.84            | 1.67          | 0.7               | 8.7       | 19.5           | 22.2 | 36.4                      | 78.8             | 13.7             | 7.5              | Loamy Sand      |
| 140                       | 2376.9                         | 145                          | 2371.9                            | 0.97            | 1.62          | 0.77              | 8.6       | 18             | 19.3 | 39.3                      | 71.3             | 19.9             | 8.8              | Sandy Loam      |
| 145                       | 2371.9                         | 150                          | 2366.9                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 150                       | 2366.9                         | 155                          | 2361.9                            | 0.51            | 1.62          | 0.59              | 8.8       | 19.5           | 26.2 | 36.8                      | 82.5             | 13.7             | 3.8              | Loamy Sand      |
| 155                       | 2361.9                         | 160                          | 2356.9                            | 0.83            | 2.94          | 0.87              | 8.4       | 38.5           | 41.7 | 42.7                      | 77.5             | 15               | 7.5              | Sandy Loam      |
| 160                       | 2356.9                         | 165                          | 2351.9                            | 0.47            | 2.13          | 0.4               | 9.2       | 26.5           | 40.2 | 109                       | 35               | 35               | 30               | Clay Loam       |
| 165                       | 2351.9                         | 170                          | 2346.9                            | 0.47            | 2.23          | 0.41              | 8.2       | 30             | 45.4 | 109                       | 37.5             | 33.7             | 28.8             | Clay Loam       |
| 170                       | 2346.9                         | 175                          | 2341.9                            | 0.48            | 2.94          | 0.42              | 8.7       | 30.6           | 45.6 | 125                       | 26.3             | 58.7             | 15               | Silt Loam       |
| 175                       | 2341.9                         | 180                          | 2336.9                            | 0.63            | 1.46          | 0.57              | 9.2       | 18.2           | 23.6 | 131                       | 22.5             | 55               | 22.5             | Silt Loam       |
| 180                       | 2336.9                         | 185                          | 2331.9                            | 0.44            | 1.16          | 0.37              | 9.2       | 13.8           | 21.5 | 82.7                      | 46.3             | 37.4             | 16.3             | Loam            |
| 185                       | 2331.9                         | 190                          | 2326.9                            | 0.42            | 1.09          | 0.32              | 9.1       | 13             | 21.4 | 107                       | 27.5             | 48.7             | 23.8             | Loam            |
| 190                       | 2326.9                         | 195                          | 2321.9                            | 0.32            | 1.21          | 0.3               | 9.0       | 14.3           | 25.6 | 114                       | 22.5             | 46.2             | 31.3             | Clay Loam       |
| 195                       | 2321.9                         | 200                          | 2316.9                            | 0.65            | 1.82          | 0.87              | 9.1       | 23.4           | 26.9 | 93.5                      | 32.5             | 38.7             | 28.8             | Clay Loam       |
| 200                       | 2316.9                         | 205                          | 2311.9                            | 0.36            | 0.78          | 0.31              | 9.0       | 9.04           | 15.6 | 86.3                      | 42.5             | 35               | 22.5             | Loam            |
| 205                       | 2311.9                         | 210                          | 2306.9                            | 0.41            | 0.99          | 0.33              | 8.9       | 12             | 19.7 | 106                       | 27.5             | 36.2             | 36.3             | Clay Loam       |
| 210                       | 2306.9                         | 215                          | 2301.9                            | 0.7             | 1.57          | 0.44              | 8.7       | 16.3           | 21.5 | 96                        | 25               | 36.2             | 38.8             | Clay Loam       |
| 215                       | 2301.9                         | 220                          | 2296.9                            | 0.18            | 1.42          | 0.19              | 8.5       | 13.9           | 32.3 | 79.3                      | 33.8             | 28.7             | 37.5             | Clay Loam       |
| 220                       | 2296.9                         | 225                          | 2291.9                            | 0.81            | 1.19          | 0.49              | 8.2       | 11.6           | 14.3 | 72                        | 52.5             | 22.5             | 25               | Sandy Clay Loam |
| 225                       | 2291.9                         | 230                          | 2286.9                            | 0.63            | 2.86          | 0.49              | 8.1       | 33.3           | 44.3 | 70.6                      | 61.3             | 20               | 18.8             | Sandy Loam      |
| 230                       | 2286.9                         | 235                          | 2281.9                            | 0.58            | 2.95          | 0.54              | 8.1       | 32             | 42.9 | 67.7                      | 62.5             | 20               | 17.5             | Sandy Loam      |
| 235                       | 2281.9                         | 240                          | 2276.9                            | 0.47            | 0.96          | 0.58              | 8.7       | 10             | 13.9 | 97                        | 55               | 30               | 15               | Sandy Loam      |
| 240                       | 2276.9                         | 245                          | 2271.9                            | 0.53            | 0.8           | 0.57              | 9.0       | 8.03           | 10.8 | 106                       | 46.3             | 33.7             | 20               | Loam            |
| 245                       | 2271.9                         | 250                          | 2266.9                            | 1.04            | 0.98          | 1.27              | 9.0       | 11.3           | 10.6 | 102                       | 53.8             | 32.4             | 13.8             | Sandy Loam      |

Statistical Summary

|         |      |      |      |     |      |      |      |    |      |      |
|---------|------|------|------|-----|------|------|------|----|------|------|
| Min     | 0.18 | 0.53 | 0.19 | 7.6 | 1.76 | 1.08 | 36.4 | 10 | 3.7  | 3.8  |
| Average | 0.71 | 1.77 | 0.75 | 8.8 | 19.8 | 26.1 | 83.2 | 50 | 30   | 20   |
| Max     | 2.59 | 3.62 | 2.67 | 9.7 | 41.9 | 48.3 | 170  | 90 | 61.2 | 41.3 |
| Number  | 45   | 45   | 45   | 45  | 45   | 45   | 45   | 45 | 45   | 45   |

Depth to Coal: 55'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.43 | 0.53 | 0.39 | 7.6 | 1.76 | 1.08 | 47.8 | 10   | 12.4 | 7.5  |
| Average | 1.17 | 1.40 | 1.34 | 8.5 | 12.7 | 13.6 | 98.5 | 33   | 40   | 27   |
| Max     | 2.59 | 2.26 | 2.67 | 9.2 | 22.1 | 26.7 | 170  | 63.8 | 61.2 | 41.3 |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11   | 11   | 11   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.40

OVERBURDEN ANALYSIS DATA FOR SHOB-35R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2502.2                         | 5                            | 2497.2                            | 1.14            | 0.74          | 1.17              | 7.8       | 5.58           | 5.19 | 66.4                      | 18.8             | 48.7             | 32.5             | Silty Clay Loam |
| 5                         | 2497.2                         | 10                           | 2492.2                            | 6.99            | 4.2           | 9.28              | 7.9       | 30.4           | 10.7 | 74.3                      | 25               | 47.5             | 27.5             | Clay Loam       |
| 10                        | 2492.2                         | 15                           | 2487.2                            | 12.9            | 6.98          | 21.6              | 8.1       | 56.7           | 13.6 | 115                       | 8.8              | 53.7             | 37.5             | Silty Clay Loam |
| 15                        | 2487.2                         | 20                           | 2482.2                            | 16.1            | 7.62          | 21.3              | 7.9       | 63.7           | 14.7 | 108                       | 18.8             | 51.2             | 30               | Silty Clay Loam |
| 20                        | 2482.2                         | 25                           | 2477.2                            | 2.99            | 3.39          | 3.96              | 8.1       | 29             | 15.6 | 164                       | 31.3             | 41.2             | 27.5             | Clay Loam       |
| 25                        | 2477.2                         | 30                           | 2472.2                            | 0.46            | 1.89          | 0.79              | 8.8       | 18.8           | 23.8 | 155                       | 16.3             | 62.4             | 21.3             | Silt Loam       |
| 30                        | 2472.2                         | 35                           | 2467.2                            | 0.61            | 2.68          | 0.96              | 8.8       | 27.3           | 30.8 | 129                       | 33.8             | 47.4             | 18.8             | Loam            |
| 35                        | 2467.2                         | 40                           | 2462.2                            | 0.47            | 1.91          | 0.55              | 8.5       | 17.8           | 24.9 | 115                       | 41.3             | 36.2             | 22.5             | Loam            |
| 40                        | 2462.2                         | 45                           | 2457.2                            | 0.88            | 3.62          | 0.9               | 8.7       | 36.2           | 38.4 | 85.9                      | 65               | 20               | 15               | Sandy Loam      |
| 70                        | 2432.2                         | 75                           | 2427.2                            | 0.39            | 2.02          | 0.36              | 7.4       | 19.6           | 32   | 176                       | 18.8             | 23.7             | 57.5             | Clay            |
| 75                        | 2427.2                         | 80                           | 2422.2                            | 0.23            | 1.27          | 0.15              | 8.7       | 12.9           | 29.8 | 159                       | 7.5              | 57.5             | 35               | Silty Clay Loam |
| 80                        | 2422.2                         | 85                           | 2417.2                            | 0.35            | 1.37          | 0.22              | 8.6       | 13.7           | 25.9 | 142                       | 16.3             | 53.7             | 30               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.23 | 0.74 | 0.15 | 7.4 | 5.58 | 5.19 | 66.4 | 7.5 | 20   | 15   |
| Average | 3.63 | 3.14 | 5.10 | 8.3 | 27.6 | 22.1 | 124  | 25  | 45   | 30   |
| Max     | 16.1 | 7.62 | 21.6 | 8.8 | 63.7 | 38.4 | 176  | 65  | 62.4 | 57.5 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12  | 12   | 12   |

Depth to Coal: 48'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.46 | 0.74 | 0.55 | 7.8 | 5.58 | 5.19 | 66.4 | 8.8 | 20   | 15   |
| Average | 4.73 | 3.67 | 6.72 | 8.3 | 31.7 | 19.7 | 113  | 29  | 45   | 26   |
| Max     | 16.1 | 7.62 | 21.6 | 8.8 | 63.7 | 38.4 | 164  | 65  | 62.4 | 37.5 |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9   | 9    | 9    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.41

OVERBURDEN ANALYSIS DATA FOR SHOB-36R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2585.1                         | 5                            | 2580.1                            | 10.9            | 2.96          | 12                | 7.9       | 16.3           | 4.81 | 98.6                      | 11.3             | 41.2             | 47.5             | Silty Clay      |
| 5                         | 2580.1                         | 10                           | 2575.1                            | 21.3            | 7.51          | 29.6              | 8.0       | 62.7           | 12.4 | 134                       | 6.3              | 47.4             | 46.3             | Silty Clay      |
| 10                        | 2575.1                         | 15                           | 2570.1                            | 24.2            | 5.82          | 19.3              | 7.7       | 39.8           | 8.53 | 86                        | 17.5             | 45               | 37.5             | Silty Clay Loam |
| 15                        | 2570.1                         | 20                           | 2565.1                            | 33.4            | 8.27          | 29.2              | 7.1       | 59.1           | 10.6 | 76.5                      | 35               | 37.5             | 27.5             | Clay Loam       |
| 20                        | 2565.1                         | 25                           | 2560.1                            | 6.44            | 2.47          | 6.49              | 7.8       | 14.5           | 5.69 | 35.8                      | 70               | 18.7             | 11.3             | Sandy Loam      |
| 25                        | 2560.1                         | 30                           | 2555.1                            | 3.27            | 1.26          | 3                 | 7.9       | 6.47           | 3.66 | 36.5                      | 80               | 8.7              | 11.3             | Sandy Loam      |
| 30                        | 2555.1                         | 35                           | 2550.1                            | 3.33            | 1.3           | 3.09              | 7.8       | 6.74           | 3.76 | 31.2                      | 77.5             | 12.5             | 10               | Sandy Loam      |
| 35                        | 2550.1                         | 40                           | 2545.1                            | 11.4            | 2.76          | 10.1              | 7.7       | 11.9           | 3.63 | 33.4                      | 70               | 18.7             | 11.3             | Sandy Loam      |
| 40                        | 2545.1                         | 45                           | 2540.1                            | 2.78            | 1.61          | 3.09              | 8.1       | 10.6           | 6.19 | 39                        | 77.5             | 13.7             | 8.8              | Sandy Loam      |
| 45                        | 2540.1                         | 50                           | 2535.1                            | 1.7             | 1.66          | 1.75              | 8.3       | 12.7           | 9.64 | 39.4                      | 65               | 23.7             | 11.3             | Sandy Loam      |
| 50                        | 2535.1                         | 55                           | 2530.1                            | 1.17            | 1.7           | 1.04              | 8.2       | 15.1           | 14.4 | 112                       | 22.5             | 43.7             | 33.8             | Clay Loam       |
| 55                        | 2530.1                         | 60                           | 2525.1                            | 0.83            | 1.79          | 1.09              | 8.7       | 16.7           | 17.1 | 131                       | 2.5              | 68.7             | 28.8             | Silty Clay Loam |
| 60                        | 2525.1                         | 65                           | 2520.1                            | 0.65            | 1.92          | 0.76              | 8.8       | 18             | 21.4 | 146                       | 12.5             | 38.7             | 48.8             | Clay            |
| 65                        | 2520.1                         | 70                           | 2515.1                            | 0.59            | 2.01          | 0.64              | 9.0       | 20.9           | 26.6 | 141                       | 22.5             | 31.2             | 46.3             | Clay            |
| 70                        | 2515.1                         | 75                           | 2510.1                            | 0.53            | 1.91          | 0.56              | 9.3       | 18.7           | 25.3 | 102                       | 35               | 41.2             | 23.8             | Loam            |
| 75                        | 2510.1                         | 80                           | 2505.1                            | 0.49            | 2.3           | 0.48              | 7.6       | 23.7           | 34   | 103                       | 35               | 43.7             | 21.3             | Loam            |
| 95                        | 2490.1                         | 100                          | 2485.1                            | 0.51            | 1.57          | 0.4               | 9.0       | 19.5           | 29   | 117                       | 21.3             | 54.9             | 23.8             | Silt Loam       |
| 100                       | 2485.1                         | 105                          | 2480.1                            | 0.44            | 2.01          | 0.38              | 9.4       | 21             | 32.9 | 51.5                      | 75               | 12.5             | 12.5             | Sandy Loam      |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.44 | 1.26 | 0.38 | 7.1 | 6.47 | 3.63 | 31.2 | 2.5 | 8.7  | 8.8  |
| Average | 6.89 | 2.82 | 6.83 | 8.2 | 21.9 | 15.0 | 84.1 | 41  | 33   | 26   |
| Max     | 33.4 | 8.27 | 29.6 | 9.4 | 62.7 | 34   | 146  | 80  | 68.7 | 48.8 |
| Number  | 18   | 18   | 18   | 18  | 18   | 18   | 18   | 18  | 18   | 18   |

Depth to Coal: 78'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.49 | 1.26 | 0.48 | 7.1 | 6.47 | 3.63 | 31.2 | 2.5 | 8.7  | 8.8  |
| Average | 7.69 | 2.95 | 7.64 | 8.1 | 22.1 | 13.0 | 84.1 | 40  | 33   | 27   |
| Max     | 33.4 | 8.27 | 29.6 | 9.3 | 62.7 | 34   | 146  | 80  | 68.7 | 48.8 |
| Number  | 16   | 16   | 16   | 16  | 16   | 16   | 16   | 16  | 16   | 16   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-37R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2564.9                         | 5                            | 2559.9                            | 26              | 4.15          | 29.3              | 7.9       | 11.4           | 2.16 | 117.3                     | 7.5              | 42.5             | 50               | Silty Clay      |
| 5                         | 2559.9                         | 10                           | 2554.9                            | 18.8            | 6.9           | 46.9              | 7.8       | 44             | 7.67 | 115.2                     | <1.3             | 50               | 50               | Silty Clay      |
| 10                        | 2554.9                         | 15                           | 2549.9                            | 27.9            | 10.6          | 74.6              | 6.6       | 83.9           | 11.7 | 99.1                      | 2.5              | 45               | 52.5             | Silty Clay      |
| 15                        | 2549.9                         | 20                           | 2544.9                            | 21.8            | 11            | 91.6              | 7.0       | 79.3           | 10.5 | 97.4                      | 0                | 50               | 50               | Silty Clay      |
| 20                        | 2544.9                         | 25                           | 2539.9                            | 18.9            | 8.81          | 59.4              | 7.7       | 60.7           | 9.7  | 87.4                      | 5                | 52.5             | 42.5             | Silty Clay      |
| 25                        | 2539.9                         | 30                           | 2534.9                            | 19.9            | 12.3          | 91.9              | 8.1       | 95.4           | 12.8 | 54.3                      | 12.5             | 67.5             | 20               | Silt Loam       |
| 30                        | 2534.9                         | 35                           | 2529.9                            | 14.8            | 9.53          | 46.8              | 8.0       | 84.6           | 15.3 | 50.4                      | 42.5             | 32.5             | 25               | Loam            |
| 35                        | 2529.9                         | 40                           | 2524.9                            | 3.65            | 5.39          | 5.86              | 8.3       | 58.1           | 26.6 | 59.2                      | 13.8             | 53.7             | 32.5             | Silty Clay Loam |
| 40                        | 2524.9                         | 45                           | 2519.9                            | 4.08            | 5.74          | 6.41              | 8.2       | 63.3           | 27.6 | 129.8                     | 11.3             | 56.2             | 32.5             | Silty Clay Loam |
| 45                        | 2519.9                         | 50                           | 2514.9                            | 0.87            | 3.1           | 1.53              | 8.9       | 33.9           | 31   | 141.3                     | 32.5             | 37.5             | 30               | Clay Loam       |
| 50                        | 2514.9                         | 55                           | 2509.9                            | 0.97            | 4.47          | 1.9               | 9.0       | 51.6           | 43   | 69.5                      | 70               | 12.5             | 17.5             | Sandy Loam      |
| 55                        | 2509.9                         | 60                           | 2504.9                            | 0.8             | 3.76          | 1.2               | 9.1       | 49.3           | 49.3 | 88.5                      | 52.5             | 27.5             | 20               | Sandy Loam      |
| 60                        | 2504.9                         | 65                           | 2499.9                            | 2.5             | 8.19          | 4.92              | 8.3       | 101            | 52.3 | 76.3                      | 55               | 23.7             | 21.3             | Sandy Clay Loam |
| 80                        | 2484.9                         | 85                           | 2479.9                            | 0.7             | 3.94          | 1                 | 8.0       | 45.1           | 48.9 | 137                       | 18.8             | 48.7             | 32.5             | Silty Clay Loam |
| 85                        | 2479.9                         | 90                           | 2474.9                            | 0.38            | 2.54          | 0.37              | 9.1       | 29.4           | 47.7 | 141                       | 12.5             | 62.5             | 25               | Silt Loam       |
| 90                        | 2474.9                         | 95                           | 2469.9                            | 0.62            | 2.8           | 0.52              | 9.2       | 34.8           | 46.2 | 115                       | 22.5             | 57.5             | 20               | Silt Loam       |

Statistical Summary

|         |      |      |      |     |      |      |       |      |      |      |
|---------|------|------|------|-----|------|------|-------|------|------|------|
| Min     | 0.38 | 2.54 | 0.37 | 6.6 | 11.4 | 2.16 | 50.4  | <1.3 | 12.5 | 17.5 |
| Average | 10.2 | 6.45 | 29.0 | 8.2 | 57.9 | 27.7 | 98.7  | 22   | 45   | 33   |
| Max     | 27.9 | 12.3 | 91.9 | 9.2 | 101  | 52.3 | 141.3 | 70   | 67.5 | 52.5 |
| Number  | 16   | 16   | 16   | 16  | 16   | 16   | 16    | 16   | 16   | 16   |

Depth to Coal: 65'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |       |    |      |      |
|---------|------|------|------|-----|------|------|-------|----|------|------|
| Min     | 0.8  | 3.1  | 1.2  | 6.6 | 11.4 | 2.16 | 50.4  | 0  | 12.5 | 17.5 |
| Average | 12.4 | 7.23 | 35.6 | 8.1 | 62.8 | 23.0 | 91.2  | 24 | 42   | 34   |
| Max     | 27.9 | 12.3 | 91.9 | 9.1 | 101  | 52.3 | 141.3 | 70 | 67.5 | 52.5 |
| Number  | 13   | 13   | 13   | 13  | 13   | 13   | 13    | 13 | 13   | 13   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- In calculating arithmetic mean < 1.3 is 0.65
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.43

OVERBURDEN ANALYSIS DATA FOR SHOB-38R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2539.5                         | 5                            | 2534.5                            | 18.1            | 10.5          | 58.8              | 8.2       | 93.9           | 15.1 | 77.1                      | 12.5             | 50               | 37.5             | Silty Clay Loam |
| 5                         | 2534.5                         | 10                           | 2529.5                            | 14.7            | 7.19          | 24                | 8.2       | 63.9           | 14.5 | 68.7                      | 16.3             | 61.2             | 22.5             | Silt Loam       |
| 10                        | 2529.5                         | 15                           | 2524.5                            | 11.4            | 7.14          | 19.4              | 8.1       | 64.5           | 16.4 | 87.4                      | 36.3             | 42.4             | 21.3             | Loam            |
| 15                        | 2524.5                         | 20                           | 2519.5                            | 10.7            | 5.5           | 14.6              | 7.7       | 47.8           | 13.5 | 176                       | 10               | 50               | 40               | Silty Clay Loam |
| 20                        | 2519.5                         | 25                           | 2514.5                            | 0.92            | 2.11          | 1.7               | 8.6       | 21.3           | 18.6 | 142                       | 70               | 12.5             | 17.5             | Sandy Loam      |
| 25                        | 2514.5                         | 30                           | 2509.5                            | 2.32            | 3.52          | 4.63              | 8.3       | 32.7           | 17.5 | 72.6                      | 70               | 7.5              | 22.5             | Sandy Clay Loam |
| 30                        | 2509.5                         | 35                           | 2504.5                            | 1.38            | 2.82          | 3.6               | 8.2       | 27.1           | 17.2 | 55.1                      | 77.5             | 7.5              | 15               | Sandy Loam      |
| 35                        | 2504.5                         | 40                           | 2499.5                            | 15.1            | 6.94          | 24.7              | 6.8       | 57.5           | 12.9 | 68.2                      | 76.3             | 7.4              | 16.3             | Sandy Loam      |
| 40                        | 2499.5                         | 45                           | 2494.5                            | 21              | 9.56          | 43.6              | 4.7       | 88             | 15.5 | 98                        | 67.5             | 16.2             | 16.3             | Sandy Loam      |
| 55                        | 2484.5                         | 60                           | 2479.5                            | 0.71            | 2.12          | 0.99              | 7.5       | 23.8           | 25.9 | 171                       | 27.5             | 42.5             | 30               | Clay Loam       |
| 60                        | 2479.5                         | 65                           | 2474.5                            | 0.42            | 1.91          | 0.56              | 8.9       | 19.9           | 28.5 | 164                       | 10               | 58.7             | 31.3             | Silty Clay Loam |
| 65                        | 2474.5                         | 70                           | 2469.5                            | 0.27            | 1.78          | 0.33              | 9.0       | 18.8           | 34.5 | 135                       | 20               | 63.7             | 16.3             | Silt Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |    |
|---------|------|------|------|-----|------|------|------|------|------|----|
| Min     | 0.27 | 1.78 | 0.33 | 4.7 | 18.8 | 12.9 | 55.1 | 10   | 7.4  | 15 |
| Average | 8.09 | 5.09 | 16.4 | 7.9 | 46.6 | 19.2 | 110  | 41   | 35   | 24 |
| Max     | 21   | 10.5 | 58.8 | 9   | 93.9 | 34.5 | 176  | 77.5 | 63.7 | 40 |
| Number  | 12   | 12   | 12   | 12  | 12   | 12   | 12   | 12   | 12   | 12 |

Depth to Coal: 42'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |    |
|---------|------|------|------|-----|------|------|------|------|------|----|
| Min     | 0.92 | 2.11 | 1.7  | 4.7 | 21.3 | 12.9 | 55.1 | 10   | 7.4  | 15 |
| Average | 10.6 | 6.14 | 21.7 | 7.6 | 55.2 | 15.7 | 93.9 | 48   | 28   | 23 |
| Max     | 21   | 10.5 | 58.8 | 8.6 | 93.9 | 18.6 | 176  | 77.5 | 61.2 | 40 |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9    | 9    | 9  |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.44

OVERBURDEN ANALYSIS DATA FOR SHOB-39R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2517.4                         | 5                            | 2512.4                            | 16.2            | 4.93          | 22.8              | 7.6       | 26.3           | 5.96 | 70.1                      | 25               | 50               | 25               | Silt Loam       |
| 5                         | 2512.4                         | 10                           | 2507.4                            | 22.2            | 8.67          | 33.8              | 7.9       | 68.4           | 12.9 | 65.6                      | 25               | 52.5             | 22.5             | Silt Loam       |
| 10                        | 2507.4                         | 15                           | 2502.4                            | 12.8            | 6.24          | 18                | 7.7       | 52.9           | 13.5 | 98.4                      | 13.8             | 62.4             | 23.8             | Silt Loam       |
| 15                        | 2502.4                         | 20                           | 2497.4                            | 14.5            | 6.43          | 16.2              | 7.5       | 57             | 14.5 | 148                       | 13.8             | 52.4             | 33.8             | Silty Clay Loam |
| 20                        | 2497.4                         | 25                           | 2492.4                            | 1.15            | 2.65          | 1.7               | 8.1       | 25             | 21   | 155                       | 61.3             | 11.2             | 27.5             | Sandy Clay Loam |
| 25                        | 2492.4                         | 30                           | 2487.4                            | 0.55            | 1.87          | 0.69              | 8.7       | 17.3           | 21.9 | 144                       | 22.5             | 52.5             | 25               | Silt Loam       |
| 30                        | 2487.4                         | 35                           | 2482.4                            | 0.5             | 2.12          | 0.53              | 8.8       | 21.3           | 29.7 | 169                       | 6.3              | 62.4             | 31.3             | Silty Clay Loam |
| 35                        | 2482.4                         | 40                           | 2477.4                            | 0.76            | 3.22          | 0.87              | 8.8       | 34.3           | 38   | 135                       | 12.5             | 58.7             | 28.8             | Silty Clay Loam |
| 40                        | 2477.4                         | 45                           | 2472.4                            | 0.32            | 1.39          | 0.23              | 9.2       | 13.5           | 25.6 | 94.4                      | 51.3             | 31.2             | 17.5             | Loam            |
| 45                        | 2472.4                         | 50                           | 2467.4                            | 0.57            | 2.3           | 0.41              | 9.0       | 22.9           | 32.7 | 82.2                      | 65               | 18.7             | 16.3             | Sandy Loam      |
| 50                        | 2467.4                         | 55                           | 2462.4                            | 0.81            | 1.69          | 0.55              | 7.4       | 16.3           | 19.8 | 71.6                      | 68.8             | 16.2             | 15               | Sandy Loam      |
| 70                        | 2447.4                         | 75                           | 2442.4                            | 0.46            | 2.64          | 0.51              | 7.5       | 30.3           | 43.6 | 144                       | 32.5             | 18.7             | 48.8             | Clay            |
| 75                        | 2442.4                         | 80                           | 2437.4                            | 0.29            | 1.58          | 0.2               | 8.7       | 14.9           | 30   | 162                       | 17.5             | 33.7             | 48.8             | Clay            |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.29 | 1.39 | 0.2  | 7.4 | 13.5 | 5.96 | 65.6 | 6.3  | 11.2 | 15   |
| Average | 5.47 | 3.52 | 7.42 | 8.2 | 30.8 | 23.8 | 118  | 32   | 40   | 28   |
| Max     | 22.2 | 8.67 | 33.8 | 9.2 | 68.4 | 43.6 | 169  | 68.8 | 62.4 | 48.8 |
| Number  | 13   | 13   | 13   | 13  | 13   | 13   | 13   | 13   | 13   | 13   |

Depth to Coal: 49'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.32 | 1.39 | 0.23 | 7.5 | 13.5 | 5.96 | 65.6 | 6.3 | 11.2 | 16.3 |
| Average | 7    | 4    | 10   | 8   | 34   | 22   | 116  | 30  | 45   | 25   |
| Max     | 22.2 | 8.67 | 33.8 | 9.2 | 68.4 | 38   | 169  | 65  | 62.4 | 33.8 |
| Number  | 10   | 10   | 10   | 10  | 10   | 10   | 10   | 10  | 10   | 10   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.45

OVERBURDEN ANALYSIS DATA FOR SHOB-40R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2564.9                         | 5                            | 2559.9                            | 2.3             | 0.42          | 1.85              | 8.0       | 0.61           | 0.42 | 33.7                      | 62.5             | 18.7             | 18.8             | Sandy Loam      |
| 5                         | 2559.9                         | 10                           | 2554.9                            | 0.53            | 0.94          | 1.96              | 8.6       | 6.79           | 6.08 | 101                       | 32.5             | 25               | 42.5             | Clay            |
| 10                        | 2554.9                         | 15                           | 2549.9                            | 1.34            | 1.55          | 3.85              | 8.2       | 11.6           | 7.17 | 110                       | 11.3             | 51.2             | 37.5             | Silty Clay Loam |
| 15                        | 2549.9                         | 20                           | 2544.9                            | 22.4            | 5.33          | 30.7              | 7.3       | 26.2           | 5.08 | 92.5                      | 7.5              | 53.7             | 38.8             | Silty Clay Loam |
| 20                        | 2544.9                         | 25                           | 2539.9                            | 18.5            | 7.72          | 45.8              | 4.8       | 55.2           | 9.73 | 88.1                      | 47.5             | 33.7             | 18.8             | Loam            |
| 35                        | 2529.9                         | 40                           | 2524.9                            | 0.75            | 3.1           | 1.2               | 8.9       | 32.2           | 32.6 | 174                       | 5                | 62.5             | 32.5             | Silty Clay Loam |
| 40                        | 2524.9                         | 45                           | 2519.9                            | 0.63            | 2.96          | 0.8               | 8.9       | 31.4           | 37.2 | 166                       | 12.5             | 62.5             | 25               | Silt Loam       |
| 45                        | 2519.9                         | 50                           | 2514.9                            | 0.31            | 2             | 0.41              | 8.8       | 20.5           | 34.1 | 161                       | 32.5             | 42.5             | 25               | Loam            |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.31 | 0.42 | 0.41 | 4.8 | 0.61 | 0.42 | 33.7 | 5    | 18.7 | 18.8 |
| Average | 5.85 | 3.00 | 10.8 | 7.9 | 23.1 | 16.5 | 116  | 26   | 44   | 30   |
| Max     | 22.4 | 7.72 | 45.8 | 8.9 | 55.2 | 37.2 | 174  | 62.5 | 62.5 | 42.5 |
| Number  | 8    | 8    | 8    | 8   | 8    | 8    | 8    | 8    | 8    | 8    |

Depth to Coal: 21'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.53 | 0.42 | 1.85 | 4.8 | 0.61 | 0.42 | 33.7 | 7.5  | 18.7 | 18.8 |
| Average | 9.01 | 3.19 | 16.8 | 7.4 | 20.1 | 5.7  | 85.1 | 32   | 36   | 31   |
| Max     | 22.4 | 7.72 | 45.8 | 8.6 | 55.2 | 9.73 | 110  | 62.5 | 53.7 | 42.5 |
| Number  | 5    | 5    | 5    | 5   | 5    | 5    | 5    | 5    | 5    | 5    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.46

OVERBURDEN ANALYSIS DATA FOR SHOB-41R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2542.5                         | 5                            | 2537.5                            | 24.9            | 5.85          | 37.3              | 7.8       | 23.7           | 4.26 | 77.3                      | 13.8             | 53.7             | 32.5             | Silty Clay Loam |
| 5                         | 2537.5                         | 10                           | 2532.5                            | 17.1            | 7.43          | 55.6              | 5.3       | 43             | 7.14 | 82.8                      | 18.8             | 38.7             | 42.5             | Clay            |
| 10                        | 2532.5                         | 15                           | 2527.5                            | 15.2            | 6.84          | 36.5              | 5.8       | 34.4           | 6.76 | 84.6                      | 3.8              | 38.7             | 57.5             | Clay            |
| 15                        | 2527.5                         | 20                           | 2522.5                            | 18.7            | 6.83          | 40.7              | 7.4       | 40.4           | 7.41 | 80                        | 16.3             | 48.7             | 35               | Silty Clay Loam |
| 20                        | 2522.5                         | 25                           | 2517.5                            | 18.3            | 9.35          | 42.1              | 6.1       | 79.8           | 14.5 | 89.7                      | 48.8             | 26.2             | 25               | Sandy Clay Loam |
| 25                        | 2517.5                         | 30                           | 2512.5                            | 2.66            | 3.49          | 4.82              | 8.5       | 33             | 17   | 124                       | 13.8             | 56.2             | 30               | Silty Clay Loam |
| 30                        | 2512.5                         | 35                           | 2507.5                            | 0.99            | 1.96          | 1.17              | 8.8       | 15.1           | 14.5 | 166                       | 8.8              | 61.2             | 30               | Silty Clay Loam |
| 35                        | 2507.5                         | 40                           | 2502.5                            | 0.55            | 1.65          | 0.55              | 9.1       | 12.4           | 16.7 | 144                       | 17.5             | 40               | 42.5             | Silty Clay      |
| 40                        | 2502.5                         | 45                           | 2497.5                            | 1.06            | 3.15          | 1.41              | 7.9       | 25.4           | 22.9 | 117                       | 36.3             | 33.7             | 30               | Clay Loam       |
| 60                        | 2482.5                         | 65                           | 2477.5                            | 0.68            | 1.79          | 0.79              | 7.8       | 17.6           | 20.5 | 152                       | 28.8             | 46.2             | 25               | Loam            |
| 65                        | 2477.5                         | 70                           | 2472.5                            | 0.36            | 1.14          | 0.27              | 9.2       | 9.58           | 17.2 | 114                       | 28.8             | 43.7             | 27.5             | Clay Loam       |
| 70                        | 2472.5                         | 75                           | 2467.5                            | 0.36            | 1.49          | 0.27              | 9.2       | 12.1           | 21.6 | 121                       | 61.3             | 19.9             | 18.8             | Sandy Loam      |
| 75                        | 2467.5                         | 80                           | 2462.5                            | 0.45            | 1.6           | 0.32              | 8.5       | 12.4           | 19.9 | 113                       | 43.8             | 38.7             | 17.5             | Loam            |
| 80                        | 2462.5                         | 85                           | 2457.5                            | 1.19            | 2.71          | 1.45              | 8.6       | 30.5           | 26.6 | 121                       | 23.8             | 51.2             | 25               | Silt Loam       |
| 85                        | 2457.5                         | 90                           | 2452.5                            | 0.72            | 2.05          | 0.65              | 8.9       | 21.7           | 26.3 | 104                       | 53.8             | 28.7             | 17.5             | Sandy Loam      |
| 90                        | 2452.5                         | 95                           | 2447.5                            | 0.49            | 1.06          | 0.3               | 9.3       | 10.3           | 16.4 | 117                       | 26.3             | 53.7             | 20               | Silt Loam       |
| 95                        | 2447.5                         | 100                          | 2442.5                            | 0.22            | 1.15          | 0.19              | 9.5       | 11.2           | 24.9 | 70.8                      | 53.8             | 36.2             | 10               | Sandy Loam      |
| 100                       | 2442.5                         | 105                          | 2437.5                            | 0.48            | 1.77          | 0.48              | 8.9       | 17.7           | 25.4 | 99.8                      | 56.3             | 31.2             | 12.5             | Sandy Loam      |
| 105                       | 2437.5                         | 110                          | 2432.5                            | 0.9             | 1.2           | 0.61              | 8.9       | 13.1           | 15   | 114                       | 30               | 48.7             | 21.3             | Loam            |
| 110                       | 2432.5                         | 115                          | 2427.5                            |                 | 1.74          |                   |           |                |      | 53.2                      | 75               | 13.7             | 11.3             | Sandy Loam      |
| 115                       | 2427.5                         | 120                          | 2422.5                            | 0.63            | 16.1          | 0.7               | 9.1       | 13.1           | 15.5 | 68.8                      | 72.5             | 16.2             | 11.3             | Sandy Loam      |
| 120                       | 2422.5                         | 125                          | 2417.5                            | 6.94            | 4.72          | 12.4              | 6.9       | 43             | 13.8 | 58.4                      | 55               | 22.5             | 22.5             | Sandy Clay Loam |
| 125                       | 2417.5                         | 130                          | 2412.5                            | 0.93            | 1.61          | 1.39              | 8.7       | 15.1           | 14   | 67.8                      | 77.5             | 12.5             | 10               | Sandy Loam      |
| 130                       | 2412.5                         | 135                          | 2407.5                            | 0.93            | 1.63          | 1.45              | 8.5       | 16.4           | 15   | 88.7                      | 47.5             | 32.5             | 20               | Loam            |
| 135                       | 2407.5                         | 140                          | 2402.5                            |                 | 2.54          |                   |           |                |      | 46.5                      | 77.5             | 12.5             | 10               | Sandy Loam      |
| 140                       | 2402.5                         | 145                          | 2397.5                            | 1.04            | 1.32          | 0.59              | 9.4       | 14.3           | 15.9 | 71.6                      | 70               | 17.5             | 12.5             | Sandy Loam      |
| 145                       | 2397.5                         | 150                          | 2392.5                            |                 | 2.42          |                   |           |                |      | 49.6                      | 77.5             | 12.5             | 10               | Sandy Loam      |
| 150                       | 2392.5                         | 155                          | 2387.5                            |                 | 2.37          |                   |           |                |      | 55.5                      | 77.5             | 10               | 12.5             | Sandy Loam      |
| 155                       | 2387.5                         | 160                          | 2382.5                            | 0.66            | 1.18          | 0.49              | 9.1       | 12.4           | 16.3 | 153                       | 15               | 37.5             | 47.5             | Clay            |
| 160                       | 2382.5                         | 165                          | 2377.5                            | 3.43            | 4.65          | 3.89              | 7.8       | 60             | 31.3 | 67.6                      | 55               | 20               | 25               | Sandy Clay Loam |
| 165                       | 2377.5                         | 170                          | 2372.5                            | 0.91            | 1.77          | 0.64              | 8.8       | 18.6           | 21.1 | 134                       | 22.5             | 31.2             | 46.3             | Clay            |
| 170                       | 2372.5                         | 175                          | 2367.5                            | 1.55            | 2             | 1.23              | 9.0       | 23.1           | 19.6 | 51.4                      | 47.5             | 28.7             | 23.8             | Loam            |
| 175                       | 2367.5                         | 180                          | 2362.5                            | 1.08            | 2.04          | 0.95              | 8.8       | 24.6           | 24.4 | 130                       | 40               | 35               | 25               | Loam            |
| 180                       | 2362.5                         | 185                          | 2357.5                            | 13.9            | 7.78          | 27.4              | 7.6       | 66.3           | 14.6 | 65.5                      | 50               | 23.7             | 26.3             | Sandy Clay Loam |
| 185                       | 2357.5                         | 190                          | 2352.5                            | 0.69            | 1.42          | 0.49              | 9.0       | 16             | 20.8 | 141                       | 12.5             | 42.5             | 45               | Silty Clay      |
| 190                       | 2352.5                         | 195                          | 2347.5                            | 0.86            | 1.26          | 0.52              | 9.3       | 15.5           | 18.6 | 136                       | 11.3             | 49.9             | 38.8             | Silty Clay Loam |
| 195                       | 2347.5                         | 200                          | 2342.5                            |                 |               |                   |           |                |      |                           | 16.3             | 48.8             | 35               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.22 | 1.06 | 0.19 | 5.3 | 9.58 | 4.26 | 46.5 | 3.8  | 10   | 10   |
| Average | 4.34 | 3.31 | 8.68 | 8.4 | 25.1 | 17.7 | 98.1 | 40   | 34   | 26   |
| Max     | 24.9 | 16.1 | 55.6 | 9.5 | 79.8 | 31.3 | 166  | 77.5 | 61.2 | 57.5 |
| Number  | 32   | 36   | 32   | 32  | 32   | 32   | 36   | 37   | 37   | 37   |

Depth to Coal: 45'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.55 | 1.65 | 0.55 | 5.3 | 12.4 | 4.26 | 77.3 | 3.8  | 26.2 | 25   |
| Average | 11.1 | 5.17 | 24.5 | 7.4 | 34.1 | 12.4 | 107  | 20   | 44   | 36   |
| Max     | 24.9 | 9.35 | 55.6 | 9.1 | 79.8 | 22.9 | 166  | 48.8 | 61.2 | 57.5 |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9    | 9    | 9    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-42R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2501.2                         | 5                            | 2496.2                            | 2.21            | 0.79          | 1.5               | 7.4       | 4.21           | 3.09 | 93.6                      | 17.5             | 47.5             | 35               | Clay            |
| 5                         | 2496.2                         | 10                           | 2491.2                            | 3.89            | 0.84          | 2.69              | 7.7       | 2.92           | 1.61 | 102                       | 27.5             | 30               | 42.5             | Clay            |
| 10                        | 2491.2                         | 15                           | 2486.2                            | 2.73            | 0.66          | 1.85              | 7.6       | 2.06           | 1.36 | 84.4                      | 17.5             | 52.5             | 30               | Silty Clay Loam |
| 15                        | 2486.2                         | 20                           | 2481.2                            | 1.15            | 0.51          | 0.92              | 7.9       | 3.06           | 3    | 67                        | 50               | 20               | 30               | Loam            |
| 20                        | 2481.2                         | 25                           | 2476.2                            | 1.26            | 0.66          | 1.25              | 7.8       | 4              | 3.57 | 57.5                      | 55               | 25               | 20               | Sandy Clay Loam |
| 25                        | 2476.2                         | 30                           | 2471.2                            | 1.18            | 0.73          | 1.44              | 7.9       | 4.66           | 4.07 | 60.7                      | 55               | 27.5             | 17.5             | Sandy Loam      |
| 30                        | 2471.2                         | 35                           | 2466.2                            | 1.65            | 1.12          | 2.68              | 8.4       | 7.26           | 4.94 | 73.8                      | 55               | 30               | 15               | Sandy Loam      |
| 55                        | 2446.2                         | 60                           | 2441.2                            | 0.39            | 1.07          | 0.35              | 8.7       | 10.8           | 17.7 | 172                       | 5                | 42.5             | 52.5             | Silty Clay      |
| 60                        | 2441.2                         | 65                           | 2436.2                            | 0.37            | 1.24          | 0.36              | 8.3       | 12.4           | 20.5 | 163                       | 5                | 45               | 50               | Silty Clay      |
| 65                        | 2436.2                         | 70                           | 2431.2                            | 0.35            | 1.54          | 0.4               | 8.8       | 15.9           | 26   | 159                       | 5                | 37.5             | 57.5             | Clay            |

Statistical Summary

|         |      |      |      |     |      |      |      |    |      |      |
|---------|------|------|------|-----|------|------|------|----|------|------|
| Min     | 0.35 | 0.51 | 0.35 | 7.4 | 2.06 | 1.36 | 57.5 | 5  | 20   | 15   |
| Average | 1.52 | 0.92 | 1.34 | 8.1 | 6.73 | 8.6  | 103  | 29 | 36   | 35   |
| Max     | 3.89 | 1.54 | 2.69 | 8.8 | 15.9 | 26   | 172  | 55 | 52.5 | 57.5 |
| Number  | 10   | 10   | 10   | 10  | 10   | 10   | 10   | 10 | 10   | 10   |

Depth to Coal: 37'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 1.15 | 0.51 | 0.92 | 7.4 | 2.06 | 1.36 | 57.5 | 17.5 | 20   | 15   |
| Average | 2.01 | 0.76 | 1.76 | 7.8 | 4.02 | 3.1  | 77.0 | 40   | 33   | 27   |
| Max     | 3.89 | 1.12 | 2.69 | 8.4 | 7.26 | 4.94 | 102  | 55   | 52.5 | 42.5 |
| Number  | 7    | 7    | 7    | 7   | 7    | 7    | 7    | 7    | 7    | 7    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-43R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2519.2                         | 5                            | 2514.2                            | 2.56            | 2.51          | 5.66              | 8.0       | 17.4           | 8.57 | 56.7                      | 45               | 28.7             | 26.3             | Loam            |
| 5                         | 2514.2                         | 10                           | 2509.2                            | 24.3            | 7.11          | 31                | 7.8       | 43.8           | 8.34 | 116                       | 7.5              | 41.2             | 51.3             | Silty Clay      |
| 10                        | 2509.2                         | 15                           | 2504.2                            | 25.2            | 6.15          | 26.2              | 7.5       | 37.1           | 7.32 | 105                       | 6.3              | 46.2             | 47.5             | Silty Clay      |
| 15                        | 2504.2                         | 20                           | 2499.2                            | 16.5            | 8.99          | 28.5              | 5.8       | 87.3           | 18.4 | 102                       | 25               | 33.7             | 41.3             | Clay            |
| 20                        | 2499.2                         | 25                           | 2494.2                            | 16.3            | 5.98          | 19.8              | 6.7       | 41.5           | 9.77 | 75.5                      | 20               | 46.2             | 33.8             | Silty Clay Loam |
| 25                        | 2494.2                         | 30                           | 2489.2                            | 11.8            | 6.74          | 15                | 7.1       | 58.5           | 16   | 90                        | 23.8             | 39.9             | 36.3             | Clay Loam       |
| 30                        | 2489.2                         | 35                           | 2484.2                            | 2.45            | 3.16          | 3                 | 8.0       | 28.3           | 17.2 | 155                       | 11.3             | 56.2             | 32.5             | Silty Clay Loam |
| 35                        | 2484.2                         | 40                           | 2479.2                            | 2.42            | 3.99          | 2.94              | 8.2       | 38.3           | 23.4 | 165                       | 17.5             | 47.5             | 35               | Silty Clay Loam |
| 40                        | 2479.2                         | 45                           | 2474.2                            | 1.82            | 3.58          | 2.13              | 8.5       | 33.1           | 23.5 | 164                       | 6.3              | 57.4             | 36.3             | Silty Clay Loam |
| 45                        | 2474.2                         | 50                           | 2469.2                            | 2.23            | 4.25          | 2.4               | 8.5       | 40.9           | 26.9 | 136                       | 40               | 31.2             | 28.8             | Clay Loam       |
| 50                        | 2469.2                         | 55                           | 2464.2                            | 1.83            | 3.75          | 1.89              | 8.6       | 35.9           | 26.3 | 119                       | 52.5             | 25               | 22.5             | Sandy Clay Loam |
| 55                        | 2464.2                         | 60                           | 2459.2                            | 4.39            | 6.43          | 5.08              | 8.4       | 64.5           | 29.6 | 104                       | 48.8             | 26.2             | 25               | Sandy Clay Loam |
| 60                        | 2459.2                         | 65                           | 2454.2                            | 4.12            | 4.62          | 5.05              | 7.6       | 44.9           | 21   | 99.8                      | 48.8             | 26.2             | 25               | Sandy Clay Loam |
| 65                        | 2454.2                         | 70                           | 2449.2                            | 6.31            | 8.19          | 7.97              | 7.5       | 91.4           | 34.2 | 69.8                      | 72.5             | 15               | 12.5             | Sandy Loam      |
| 90                        | 2429.2                         | 95                           | 2424.2                            | 0.78            | 3.15          | 0.81              | 7.5       | 31.2           | 34.9 | 141                       | 50               | 22.5             | 27.5             | Sandy Clay Loam |
| 95                        | 2424.2                         | 100                          | 2419.2                            | 0.33            | 1.84          | 0.28              | 8.0       | 17.1           | 30.8 | 144                       | 30               | 38.7             | 31.3             | Clay Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.33 | 1.84 | 0.28 | 5.8 | 17.1 | 7.32 | 56.7 | 6.3  | 15   | 12.5 |
| Average | 7.71 | 5.03 | 9.86 | 7.7 | 44.5 | 21.0 | 115  | 32   | 36   | 32   |
| Max     | 25.2 | 8.99 | 31   | 8.6 | 91.4 | 34.9 | 165  | 72.5 | 57.4 | 51.3 |
| Number  | 16   | 16   | 16   | 16  | 16   | 16   | 16   | 16   | 16   | 16   |

Depth to Coal: 68'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 1.82 | 2.51 | 1.89 | 5.8 | 17.4 | 7.32 | 56.7 | 6.3  | 15   | 12.5 |
| Average | 8.73 | 5.39 | 11.2 | 7.7 | 47.4 | 19.3 | 111  | 30   | 37   | 32   |
| Max     | 25.2 | 8.99 | 31   | 8.6 | 91.4 | 34.2 | 165  | 72.5 | 57.4 | 51.3 |
| Number  | 14   | 14   | 14   | 14  | 14   | 14   | 14   | 14   | 14   | 14   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
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- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-44R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2521.8                         | 5                            | 2516.8                            | 28.2            | 6.02          | 33.7              | 7.4       | 29.1           | 5.24 | 65.5                      | 11.3             | 36.3             | 52.5             | Clay            |
| 5                         | 2516.8                         | 10                           | 2511.8                            | 12.7            | 4.79          | 17.9              | 8.1       | 32.7           | 8.34 | 87                        | 6.3              | 53.7             | 40               | Silty Clay Loam |
| 10                        | 2511.8                         | 15                           | 2506.8                            | 22.3            | 5.8           | 28.6              | 7.6       | 33.2           | 6.57 | 65.3                      | 53.8             | 22.4             | 23.8             | Sandy Clay Loam |
| 15                        | 2506.8                         | 20                           | 2501.8                            | 10.9            | 3.59          | 12.8              | 7.7       | 19.4           | 5.64 | 73.4                      | 63.8             | 18.7             | 17.5             | Sandy Loam      |
| 20                        | 2501.8                         | 25                           | 2496.8                            | 10.3            | 3.48          | 14.4              | 7.7       | 18.2           | 5.19 | 52.7                      | 67.5             | 15               | 17.5             | Sandy Loam      |
| 25                        | 2496.8                         | 30                           | 2491.8                            | 8.17            | 2.66          | 8.58              | 8.1       | 13.8           | 4.77 | 57.8                      | 66.3             | 16.2             | 17.5             | Sandy Loam      |
| 30                        | 2491.8                         | 35                           | 2486.8                            | 0.96            | 1.12          | 1.18              | 8.3       | 8.43           | 8.14 | 60.6                      | 70               | 17.5             | 12.5             | Sandy Loam      |
| 35                        | 2486.8                         | 40                           | 2481.8                            | 0.61            | 0.93          | 0.67              | 8.2       | 7.38           | 9.19 | 82.6                      | 66.3             | 16.2             | 17.5             | Sandy Loam      |
| 40                        | 2481.8                         | 45                           | 2476.8                            | 0.52            | 1.02          | 0.47              | 8.7       | 9.13           | 13   | 77.7                      | 63.8             | 13.7             | 22.5             | Sandy Clay Loam |
| 60                        | 2461.8                         | 65                           | 2456.8                            | 8.71            |               | 8.2               | 8.2       | 42.2           | 14.5 | 102                       | 21.3             | 38.7             | 40               | Clay Loam       |
| 65                        | 2456.8                         | 70                           | 2451.8                            | 10              | 4.32          | 9.55              | 8.4       | 50.5           | 16.1 | 84.9                      | 7.5              | 55               | 37.5             | Silty Clay Loam |
| 70                        | 2451.8                         | 75                           | 2446.8                            | 0.44            | 1.43          | 0.36              | 8.9       | 14             | 22.2 | 165                       | 13.8             | 32.5             | 53.8             | Clay            |
| 75                        | 2446.8                         | 80                           | 2441.8                            | 0.42            | 2.39          | 0.34              | 9.3       | 24.6           | 39.9 | 152                       | 5                | 51.2             | 43.8             | Silty Clay      |
| 80                        | 2441.8                         | 85                           | 2436.8                            | 0.32            | 1.69          | 0.24              | 9.1       | 17.4           | 32.8 | 137                       | 10               | 35               | 55               | Clay            |
| 85                        | 2436.8                         | 90                           | 2431.8                            | 0.23            | 1.63          | 0.15              | 9.2       | 16.3           | 37.2 | 162                       | 5                | 42.5             | 52.5             | Silty Clay      |
| 90                        | 2431.8                         | 95                           | 2426.8                            | 0.16            | 1.55          | 0.08              | 9.3       | 14.4           | 41.7 | 169                       | 6.3              | 33.7             | 60               | Clay            |
| 95                        | 2426.8                         | 100                          | 2421.8                            | 1.3             | 4.12          | 1.78              | 8.5       | 40.7           | 32.8 | 86.9                      | 52.5             | 13.7             | 33.8             | Sandy Clay Loam |
| 100                       | 2421.8                         | 105                          | 2416.8                            | 0.5             | 2.58          | 0.48              | 9.0       | 24.6           | 35.2 | 149                       | 15               | 45               | 40               | Silty Clay Loam |
| 105                       | 2416.8                         | 110                          | 2411.8                            | 0.38            | 2.58          | 0.27              | 9.2       | 26.8           | 47.1 | 145                       | 6.3              | 71.2             | 22.5             | Silt Loam       |
| 110                       | 2411.8                         | 115                          | 2406.8                            | 0.21            | 1.88          | 0.17              | 9.1       | 19.1           | 43.5 | 140                       | 15               | 43.7             | 41.3             | Silty Clay      |
| 115                       | 2406.8                         | 120                          | 2401.8                            | 0.39            | 2.7           | 0.32              | 9.1       | 28.1           | 47.3 | 132                       | 10               | 47.5             | 42.5             | Silty Clay      |
| 120                       | 2401.8                         | 125                          | 2396.8                            | 0.81            | 3.51          | 0.69              | 9.2       | 41.8           | 48.3 | 141                       | 11.3             | 51.2             | 37.5             | Silty Clay Loam |
| 125                       | 2396.8                         | 130                          | 2391.8                            | 0.23            | 1.74          | 0.17              | 9.1       | 17.3           | 38.6 | 143                       | 5                | 46.2             | 48.8             | Silty Clay      |
| 130                       | 2391.8                         | 135                          | 2386.8                            | 0.46            | 2.67          | 0.38              | 8.4       | 29             | 44.9 | 148                       | 17.5             | 35               | 47.5             | Clay            |
| 135                       | 2386.8                         | 140                          | 2381.8                            | 0.74            | 4.67          | 0.71              | 8.8       | 52             | 61   | 114                       | 28.8             | 36.2             | 35               | Clay Loam       |
| 140                       | 2381.8                         | 145                          | 2376.8                            | 0.24            | 1.76          | 0.17              | 9.4       | 17.5           | 39   | 115                       | 17.5             | 45               | 37.5             | Silty Clay Loam |
| 145                       | 2376.8                         | 150                          | 2371.8                            | 0.28            | 2.3           | 0.25              | 9.1       | 23.9           | 46.5 | 124                       | 2.5              | 45               | 52.5             | Silty Clay      |
| 150                       | 2371.8                         | 155                          | 2366.8                            | 0.23            | 1.9           | 0.2               | 9.1       | 18.7           | 40.3 | 132                       | 8.8              | 41.2             | 50               | Silty Clay      |
| 155                       | 2366.8                         | 160                          | 2361.8                            | 0.66            | 2.68          | 0.52              | 9.0       | 27.8           | 36.3 | 129                       | 5                | 45               | 50               | Silty Clay      |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.16 | 0.93 | 0.08 | 7.4 | 7.38 | 4.77 | 52.7 | 2.5 | 13.7 | 12.5 |
| Average | 4.19 | 2.77 | 4.94 | 8.7 | 24.8 | 28.7 | 114  | 25  | 37   | 38   |
| Max     | 28.2 | 6.02 | 33.7 | 9.4 | 52   | 61   | 169  | 70  | 71.2 | 60   |
| Number  | 29   | 28   | 29   | 29  | 29   | 29   | 29   | 29  | 29   | 29   |

Depth to Coal: 46'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.52 | 0.93 | 0.47 | 7.4 | 7.38 | 4.77 | 52.7 | 6.3 | 13.7 | 12.5 |
| Average | 10.5 | 3.27 | 13.1 | 8.0 | 19.0 | 7.3  | 69.2 | 52  | 23   | 25   |
| Max     | 28.2 | 6.02 | 33.7 | 8.7 | 33.2 | 13   | 87   | 70  | 53.7 | 52.5 |
| Number  | 9    | 9    | 9    | 9   | 9    | 9    | 9    | 9   | 9    | 9    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.50

OVERBURDEN ANALYSIS DATA FOR SHOB-45R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2550.4                         | 5                            | 2545.4                            | 2.2             | 0.81          | 2.98              | 8.1       | 3.37           | 2.09 | 45.7                      | 55               | 31.2             | 13.8             | Sandy Loam      |
| 5                         | 2545.4                         | 10                           | 2540.4                            | 2.01            | 0.98          | 3.14              | 8.2       | 5.32           | 3.31 | 55                        | 48.8             | 32.4             | 18.8             | Loam            |
| 10                        | 2540.4                         | 15                           | 2535.4                            | 2.55            | 0.98          | 2.56              | 7.9       | 5.49           | 3.43 | 100                       | 25               | 45               | 30               | Clay Loam       |
| 15                        | 2535.4                         | 20                           | 2530.4                            | 22.5            | 4.01          | 20.6              | 7.5       | 14.9           | 3.22 | 86.5                      | 25               | 43.7             | 31.3             | Clay Loam       |
| 20                        | 2530.4                         | 25                           | 2525.4                            | 2.96            | 1.8           | 4.21              | 7.9       | 11.2           | 5.89 | 82.8                      | 35               | 45               | 20               | Loam            |
| 25                        | 2525.4                         | 30                           | 2520.4                            | 2.5             | 1.9           | 3.86              | 8.0       | 14.1           | 7.9  | 83.6                      | 35               | 43.7             | 21.3             | Loam            |
| 30                        | 2520.4                         | 35                           | 2515.4                            | 1.3             | 1.99          | 2.11              | 8.2       | 17.7           | 13.5 | 91.3                      | 58.8             | 21.2             | 20               | Sandy Loam      |
| 35                        | 2515.4                         | 40                           | 2510.4                            | 0.63            | 1.27          | 0.94              | 8.5       | 11.6           | 13.1 | 112                       | 62.5             | 16.2             | 21.3             | Sandy Clay Loam |
| 55                        | 2495.4                         | 60                           | 2490.4                            | 0.52            | 1.42          | 0.55              | 8.7       | 13.1           | 18   | 145                       | 13.8             | 47.4             | 38.8             | Silty Clay Loam |
| 60                        | 2490.4                         | 65                           | 2485.4                            | 0.73            | 2.26          | 1.06              | 8.8       | 22.2           | 23.5 | 171                       | 10               | 51.2             | 38.8             | Silty Clay Loam |
| 65                        | 2485.4                         | 70                           | 2480.4                            | 0.42            | 1.4           | 0.35              | 9.3       | 14.9           | 24   | 160                       | 20               | 52.5             | 27.5             | Clay Loam       |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.42 | 0.81 | 0.35 | 7.5 | 3.37 | 2.09 | 45.7 | 10   | 16.2 | 13.8 |
| Average | 3.48 | 1.71 | 3.85 | 8.3 | 12.2 | 10.7 | 103  | 35   | 39   | 26   |
| Max     | 22.5 | 4.01 | 20.6 | 9.3 | 22.2 | 24   | 171  | 62.5 | 52.5 | 38.8 |
| Number  | 11   | 11   | 11   | 11  | 11   | 11   | 11   | 11   | 11   | 11   |

Depth to Coal: 42'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.63 | 0.81 | 0.94 | 7.5 | 3.37 | 2.09 | 45.7 | 25   | 16.2 | 13.8 |
| Average | 4.58 | 1.72 | 5.05 | 8.0 | 10.5 | 6.6  | 82.1 | 43   | 35   | 22   |
| Max     | 22.5 | 4.01 | 20.6 | 8.5 | 17.7 | 13.5 | 112  | 62.5 | 45   | 31.3 |
| Number  | 8    | 8    | 8    | 8   | 8    | 8    | 8    | 8    | 8    | 8    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-46R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2540.4                         | 5                            | 2535.4                            | 5.49            | 3.96          | 19.5              | 8.2       | 27.1           | 7.65 | 110                       | 15               | 42.5             | 42.5             | Silty Clay      |
| 5                         | 2535.4                         | 10                           | 2530.4                            | 8.86            | 5.73          | 31.9              | 8.0       | 41.5           | 9.2  | 123                       | 10               | 50               | 40               | Silty Clay Loam |
| 10                        | 2530.4                         | 15                           | 2525.4                            | 7.6             | 5.63          | 20.3              | 5.0       | 22.7           | 6.08 | 154                       | 2.5              | 25               | 72.5             | Clay            |
| 15                        | 2525.4                         | 20                           | 2520.4                            | 21.8            | 14.5          | 115               | 3.5       | 107            | 13   | 79.8                      | 57.5             | 20               | 22.5             | Sandy Clay Loam |
| 20                        | 2520.4                         | 25                           | 2515.4                            | 15.5            | 6.19          | 29.5              | 7.5       | 41.5           | 8.74 | 73                        | 17.5             | 57.5             | 25               | Silt Loam       |
| 25                        | 2515.4                         | 30                           | 2510.4                            | 1.39            | 2.66          | 3.5               | 8.3       | 23.2           | 14.9 | 177                       | 10               | 57.5             | 32.5             | Silty Clay Loam |
| 30                        | 2510.4                         | 35                           | 2505.4                            | 1.09            | 3.14          | 2.02              | 8.4       | 31.4           | 25.2 | 174                       | 7.5              | 57.5             | 35               | Silty Clay Loam |
| 35                        | 2505.4                         | 40                           | 2500.4                            | 0.56            | 2.1           | 0.78              | 8.5       | 19.9           | 24.3 | 170                       | 11.3             | 48.2             | 40               | Silty Clay Loam |
| 40                        | 2500.4                         | 45                           | 2495.4                            | 0.79            | 3.14          | 0.75              | 9.1       | 31.1           | 35.6 | 107                       | 45               | 37.5             | 17.5             | Loam            |
| 45                        | 2495.4                         | 50                           | 2490.4                            | 1.32            | 3.88          | 1.63              | 8.8       | 42.2           | 34.8 | 77.9                      | 57.5             | 30               | 12.5             | Sandy Loam      |
| 50                        | 2490.4                         | 55                           | 2485.4                            | 0.5             | 2.05          | 0.54              | 8.6       | 20             | 27.8 | 76.6                      | 70               | 17.5             | 12.5             | Sandy Loam      |
| 55                        | 2485.4                         | 60                           | 2480.4                            | 0.66            | 2.01          | 0.89              | 8.4       | 20.1           | 22.8 | 65.9                      | 71.3             | 17.4             | 11.3             | Sandy Loam      |
| 60                        | 2480.4                         | 65                           | 2475.4                            | 1.11            | 2.36          | 1.78              | 8.0       | 21.4           | 17.8 | 88.1                      | 55               | 30               | 15               | Sandy Loam      |
| 85                        | 2455.4                         | 90                           | 2450.4                            | 0.4             | 2.7           | 0.39              | 7.5       | 26.5           | 42.3 | 153                       | 28.8             | 41.2             | 30               | Clay Loam       |
| 90                        | 2450.4                         | 95                           | 2445.4                            | 0.37            | 2.44          | 0.37              | 8.1       | 25.5           | 42   | 192                       | 7.5              | 37.5             | 55               | Clay            |
| 95                        | 2445.4                         | 100                          | 2440.4                            | 1.09            | 3.93          | 0.87              | 8.5       | 46             | 46.5 | 162                       | 2.5              | 57.5             | 40               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.37 | 2.01 | 0.37 | 3.5 | 19.9 | 6.08 | 65.9 | 2.5  | 17.4 | 11.3 |
| Average | 4.28 | 4.15 | 14.4 | 7.8 | 34.2 | 23.7 | 124  | 29   | 39   | 31   |
| Max     | 21.8 | 14.5 | 115  | 9.1 | 107  | 46.5 | 192  | 71.3 | 57.5 | 72.5 |
| Number  | 16   | 16   | 16   | 16  | 16   | 16   | 16   | 16   | 16   | 16   |

Depth to Coal: 67'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |      |      |
|---------|------|------|------|-----|------|------|------|------|------|------|
| Min     | 0.5  | 2.01 | 0.54 | 3.5 | 19.9 | 6.08 | 65.9 | 2.5  | 17.4 | 11.3 |
| Average | 5.13 | 4.41 | 17.5 | 7.7 | 34.5 | 19.1 | 114  | 33   | 38   | 29   |
| Max     | 21.8 | 14.5 | 115  | 9.1 | 107  | 35.6 | 177  | 71.3 | 57.5 | 72.5 |
| Number  | 13   | 13   | 13   | 13  | 13   | 13   | 13   | 13   | 13   | 13   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-47R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2535.9                         | 5                            | 2530.9                            | 11.8            | 4.97          | 14.8              | 7.8       | 32.5           | 8.92 | 76.8                      | 11.3             | 56.2             | 32.5             | Silty Clay Loam |
| 5                         | 2530.9                         | 10                           | 2525.9                            | 14              | 9.3           | 29                | 8.0       | 75.4           | 16.3 | 143                       | 5                | 51.2             | 43.8             | Silty Clay      |
| 10                        | 2525.9                         | 15                           | 2520.9                            | 16.3            | 9.34          | 30.3              | 7.9       | 79.9           | 16.6 | 120                       | 10               | 60               | 30               | Silty Clay Loam |
| 15                        | 2520.9                         | 20                           | 2515.9                            | 5.29            | 6.36          | 14.4              | 8.2       | 60.1           | 19.1 | 153                       | 33.8             | 42.4             | 23.8             | Loam            |
| 20                        | 2515.9                         | 25                           | 2510.9                            | 3.52            | 7.65          | 12.8              | 8.4       | 76.8           | 26.9 | 98.9                      | 62.5             | 20               | 17.5             | Sandy Loam      |
| 25                        | 2510.9                         | 30                           | 2505.9                            | 2.15            | 6.76          | 6.24              | 8.5       | 70.3           | 34.3 | 254                       | 68.8             | 16.2             | 15               | Sandy Loam      |
| 30                        | 2505.9                         | 35                           | 2500.9                            | 1.14            | 3.24          | 1.81              | 8.3       | 34.5           | 28.4 | 96.8                      | 67.5             | 15               | 17.5             | Sandy Loam      |
| 35                        | 2500.9                         | 40                           | 2495.9                            | 1.17            | 3.1           | 1.54              | 8.4       | 33.9           | 29.1 | 88.1                      | 56.3             | 26.2             | 17.5             | Sandy Loam      |
| 55                        | 2480.9                         | 60                           | 2475.9                            | 0.59            | 1.89          | 0.56              | 7.9       | 19.9           | 26.2 | 148                       | 23.8             | 41.2             | 35               | Clay Loam       |
| 60                        | 2475.9                         | 65                           | 2470.9                            | 0.52            | 1.97          | 0.48              | 8.9       | 20.8           | 29.4 | 146                       | 23.8             | 46.2             | 30               | Clay Loam       |
| 65                        | 2470.9                         | 70                           | 2465.9                            | 0.55            | 2.12          | 0.54              | 8.8       | 23.8           | 32.2 | 130                       | 18.8             | 32.4             | 48.8             | Clay            |
| 70                        | 2465.9                         | 75                           | 2460.9                            | 0.54            | 1.93          | 0.47              | 8.9       | 23.5           | 33.2 | 105                       | 31.3             | 48.7             | 20               | Loam            |
| 75                        | 2460.9                         | 80                           | 2455.9                            | 0.86            | 1             | 0.58              | 9.0       | 10.7           | 12.6 | 158                       | 11.3             | 48.7             | 40               | Silty Clay Loam |
| 80                        | 2455.9                         | 85                           | 2450.9                            | 0.61            | 1.57          | 0.39              | 8.8       | 15.8           | 22.4 | 154                       | 20               | 25               | 55               | Clay            |
| 85                        | 2450.9                         | 90                           | 2445.9                            | 0.3             | 1.53          | 0.3               | 8.8       | 16.1           | 29.2 | 144                       | 16.3             | 39.9             | 43.8             | Clay            |
| 90                        | 2445.9                         | 95                           | 2440.9                            | 0.44            | 1.93          | 0.46              | 8.8       | 20.4           | 30.2 | 113                       | 25               | 42.5             | 32.5             | Clay Loam       |
| 95                        | 2440.9                         | 100                          | 2435.9                            | 0.55            | 1.94          | 0.47              | 9.1       | 20.1           | 28.1 | 106                       | 28.8             | 51.2             | 20               | Silt Loam       |
| 100                       | 2435.9                         | 105                          | 2430.9                            | 0.54            | 1.83          | 0.4               | 8.9       | 19.2           | 28.1 | 121                       | 26.3             | 47.4             | 26.3             | Loam            |
| 105                       | 2430.9                         | 110                          | 2425.9                            | 0.48            | 1.56          | 0.42              | 9.0       | 16.5           | 24.6 | 122                       | 18.8             | 56.2             | 25               | Silt Loam       |
| 110                       | 2425.9                         | 115                          | 2420.9                            | 0.33            | 1.71          | 0.34              | 8.9       | 19.4           | 33.4 | 117                       | 28.8             | 38.7             | 32.5             | Clay Loam       |
| 115                       | 2420.9                         | 120                          | 2415.9                            | 0.57            | 1.98          | 0.47              | 8.9       | 24.7           | 34.3 | 131                       | 22.5             | 40               | 37.5             | Clay Loam       |
| 120                       | 2415.9                         | 125                          | 2410.9                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 125                       | 2410.9                         | 130                          | 2405.9                            | 0.48            | 2.14          | 0.46              | 9.0       | 27.4           | 39.9 | 131                       | 28.8             | 41.2             | 30               | Clay Loam       |
| 130                       | 2405.9                         | 135                          | 2400.9                            | 0.43            | 1.47          | 0.29              | 9.0       | 14.7           | 24.4 | 128                       | 22.5             | 50               | 27.5             | Clay Loam       |
| 135                       | 2400.9                         | 140                          | 2395.9                            | 0.78            | 1.46          | 0.62              | 9.1       | 16.7           | 20   | 129                       | 18.8             | 52.4             | 28.8             | Silty Clay Loam |
| 140                       | 2395.9                         | 145                          | 2390.9                            | 0.48            | 1.27          | 0.35              | 9.2       | 12.8           | 19.8 | 116                       | 18.8             | 51.2             | 30               | Silty Clay Loam |
| 145                       | 2390.9                         | 150                          | 2385.9                            | 0.57            | 1.56          | 0.38              | 9.0       | 16.9           | 24.6 | 135                       | 18.8             | 49.9             | 31.3             | Silty Clay Loam |
| 150                       | 2385.9                         | 155                          | 2380.9                            | 0.52            | 1.32          | 0.34              | 9.0       | 13.7           | 20.9 | 133                       | 20               | 51.2             | 28.8             | Clay Loam       |
| 155                       | 2380.9                         | 160                          | 2375.9                            | 0.5             | 2.05          | 0.44              | 9.0       | 23.2           | 33.9 | 117                       | 18.8             | 49.9             | 31.3             | Silty Clay Loam |
| 160                       | 2375.9                         | 165                          | 2370.9                            | 0.69            | 1.45          | 0.48              | 9.0       | 15             | 19.6 | 125                       | 21.3             | 47.4             | 31.3             | Clay Loam       |
| 165                       | 2370.9                         | 170                          | 2365.9                            | 0.53            | 1.65          | 0.43              | 9.0       | 17.9           | 25.9 | 127                       | 21.3             | 46.2             | 32.5             | Clay Loam       |
| 170                       | 2365.9                         | 175                          | 2360.9                            | 0.59            | 1.79          | 0.52              | 9.0       | 19.2           | 25.7 | 127                       | 25               | 42.5             | 32.5             | Clay Loam       |
| 175                       | 2360.9                         | 180                          | 2355.9                            | 0.29            | 1.88          | 0.34              | 8.9       | 21.1           | 37.7 | 129                       | 21.3             | 41.2             | 37.5             | Clay Loam       |
| 180                       | 2355.9                         | 185                          | 2350.9                            | 0.43            | 1.47          | 0.36              | 8.8       | 17.6           | 28   | 139                       | 16.3             | 41.2             | 42.5             | Silty Clay      |
| 200                       | 2335.9                         | 205                          | 2330.9                            | 0.43            | 1.69          | 0.35              | 7.9       | 18.1           | 29.1 | 88                        | 56.3             | 19.9             | 23.8             | Sandy Clay Loam |
| 205                       | 2330.9                         | 210                          | 2325.9                            | 0.56            | 1.75          | 0.41              | 8.0       | 19.1           | 27.4 | 101                       | 47.5             | 26.2             | 26.3             | Sandy Clay Loam |

Statistical Summary

|         |      |      |      |     |      |      |      |      |    |    |
|---------|------|------|------|-----|------|------|------|------|----|----|
| Min     | 0.29 | 1    | 0.29 | 7.8 | 10.7 | 8.92 | 76.8 | 5    | 15 | 15 |
| Average | 1.99 | 2.76 | 3.50 | 8.7 | 27.6 | 26.3 | 127  | 28   | 42 | 31 |
| Max     | 16.3 | 9.34 | 30.3 | 9.2 | 79.9 | 39.9 | 254  | 68.8 | 60 | 55 |
| Number  | 35   | 35   | 35   | 35  | 35   | 35   | 35   | 35   | 35 | 35 |

Depth to Coal: 40'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |      |    |      |
|---------|------|------|------|-----|------|------|------|------|----|------|
| Min     | 1.14 | 3.1  | 1.54 | 7.8 | 32.5 | 8.92 | 76.8 | 5    | 15 | 15   |
| Average | 6.92 | 6.34 | 13.9 | 8.2 | 57.9 | 22.5 | 129  | 39   | 36 | 25   |
| Max     | 16.3 | 9.34 | 30.3 | 8.5 | 79.9 | 34.3 | 254  | 68.8 | 60 | 43.8 |
| Number  | 8    | 8    | 8    | 8   | 8    | 8    | 8    | 8    | 8  | 8    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.53

OVERBURDEN ANALYSIS DATA FOR SHOB-48R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2550.4                         | 5                            | 2545.4                            | 20.5            | 11.3          | 57.5              | 8.1       | 98.8           | 15.8 | 106                       | 7.5              | 42.5             | 50               | Silty Clay      |
| 5                         | 2545.4                         | 10                           | 2540.4                            | 14.3            | 9.58          | 39.1              | 8.3       | 84             | 16.3 | 71.5                      | 35               | 40               | 25               | Loam            |
| 10                        | 2540.4                         | 15                           | 2535.4                            | 0.78            | 2.89          | 1.41              | 8.7       | 25.6           | 24.5 | 168                       | 2.5              | 53.7             | 43.8             | Silty Clay      |
| 15                        | 2535.4                         | 20                           | 2530.4                            | 0.89            | 3.51          | 1.23              | 8.7       | 37.4           | 36.2 | 153                       | 10               | 55               | 35               | Silty Clay Loam |
| 20                        | 2530.4                         | 25                           | 2525.4                            | 0.85            | 3.48          | 0.89              | 8.6       | 36.5           | 39.2 | 129                       | 5                | 55               | 40               | Silty Clay Loam |
| 25                        | 2525.4                         | 30                           | 2520.4                            | 1.78            | 4.87          | 1.8               | 7.0       | 53.4           | 39.9 | 121                       | 40               | 25               | 35               | Clay Loam       |
| 30                        | 2520.4                         | 35                           | 2515.4                            | 0.77            | 3.44          | 0.75              | 8.8       | 35.7           | 40.9 | 149                       | 2.5              | 40               | 57.5             | Silty Clay      |
| 35                        | 2515.4                         | 40                           | 2510.4                            | 0.8             | 4.09          | 0.72              | 8.8       | 41.4           | 47.4 | 139                       | 16.3             | 44.9             | 38.8             | Silty Clay Loam |
| 40                        | 2510.4                         | 45                           | 2505.4                            | 0.98            | 3.84          | 1                 | 8.3       | 41.1           | 41.3 | 122                       | 25               | 40               | 35               | Clay Loam       |
| 45                        | 2505.4                         | 50                           | 2500.4                            | 0.62            | 3.81          | 0.65              | 9.0       | 39.7           | 49.7 | 154                       | 7.5              | 62.5             | 30               | Silty Clay Loam |
| 50                        | 2500.4                         | 55                           | 2495.4                            | 0.38            | 2.36          | 0.36              | 8.9       | 22.9           | 37.8 | 151                       | 5                | 52.5             | 42.5             | Silty Clay      |
| 55                        | 2495.4                         | 60                           | 2490.4                            | 1.36            | 5.8           | 1.45              | 7.4       | 66.9           | 56.4 | 163                       | 22.5             | 47.5             | 30               | Clay Loam       |
| 60                        | 2490.4                         | 65                           | 2485.4                            | 1.27            | 6.27          | 1.35              | 7.7       | 72.3           | 63.2 | 124                       | 32.5             | 42.5             | 25               | Silty Clay      |
| 65                        | 2485.4                         | 70                           | 2480.4                            | 2.38            | 10.9          | 5.57              | 8.7       | 125            | 62.6 | 103                       | 15               | 62.5             | 22.5             | Silt Loam       |
| 70                        | 2480.4                         | 75                           | 2475.4                            | 2.9             | 7.45          | 4.86              | 8.4       | 84             | 42.7 | 106                       | 15               | 50               | 35               | Silty Clay Loam |
| 75                        | 2475.4                         | 80                           | 2470.4                            | 0.49            | 3.18          | 0.6               | 8.5       | 32.4           | 44   | 156                       | 8.8              | 43.7             | 47.5             | Silty Clay      |
| 80                        | 2470.4                         | 85                           | 2465.4                            | 0.46            | 2.45          | 0.44              | 8.9       | 23.8           | 35.5 | 158                       | 7.5              | 58.7             | 33.8             | Silty Clay Loam |
| 85                        | 2465.4                         | 90                           | 2460.4                            | 0.4             | 3.35          | 0.45              | 8.9       | 35.2           | 54.1 | 198                       | 15               | 60               | 25               | Silt Loam       |
| 90                        | 2460.4                         | 95                           | 2455.4                            | 0.32            | 2.27          | 0.27              | 9.2       | 21.8           | 40.1 | 173                       | 20               | 53.7             | 26.3             | Silt Loam       |
| 95                        | 2455.4                         | 100                          | 2450.4                            | 1.09            | 9.88          | 4                 | 9.2       | 113            | 70.6 | 109                       | 57.5             | 25               | 17.5             | Sandy Loam      |
| 100                       | 2450.4                         | 105                          | 2445.4                            | 1.53            | 12.1          | 5.79              | 8.9       | 150            | 78.3 | 125                       | 60               | 22.5             | 17.5             | Sandy Loam      |
| 105                       | 2445.4                         | 110                          | 2440.4                            | 0.74            | 5.78          | 1.53              | 8.7       | 65.6           | 61.5 | 131                       | 57.5             | 22.5             | 20               | Sandy Clay Loam |
| 110                       | 2440.4                         | 115                          | 2435.4                            | 0.77            | 6.06          | 1.75              | 8.5       | 74.7           | 66.5 | 59.1                      | 70               | 17.5             | 12.5             | Sandy Loam      |
| 115                       | 2435.4                         | 120                          | 2430.4                            | 0.52            | 2.64          | 0.55              | 8.1       | 28.8           | 39.2 | 164                       | 28.8             | 41.2             | 30               | Clay Loam       |
| 135                       | 2415.4                         | 140                          | 2410.4                            | 0.56            | 2.99          | 0.54              | 8.0       | 31.7           | 42.9 | 152                       | 10               | 41.2             | 48.8             | Silty Clay      |
| 140                       | 2410.4                         | 145                          | 2405.4                            | 0.53            | 3.05          | 0.51              | 8.1       | 33.4           | 46.3 | 175                       | 5                | 32.5             | 62.5             | Clay            |
| 145                       | 2405.4                         | 150                          | 2400.4                            | 0.4             | 2.56          | 0.39              | 8.1       | 27             | 42.9 | 165                       | 10               | 30               | 60               | Clay            |

Statistical Summary

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.32 | 2.27 | 0.27 | 7   | 21.8 | 15.8 | 59.1 | 2.5 | 17.5 | 12.5 |
| Average | 2.16 | 5.18 | 5.02 | 8.5 | 55.6 | 45.8 | 138  | 22  | 43   | 35   |
| Max     | 20.5 | 12.1 | 57.5 | 9.2 | 150  | 78.3 | 198  | 70  | 62.5 | 62.5 |
| Number  | 27   | 27   | 27   | 27  | 27   | 27   | 27   | 27  | 27   | 27   |

Depth to Coal: 120'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |      |     |      |      |
|---------|------|------|------|-----|------|------|------|-----|------|------|
| Min     | 0.32 | 2.27 | 0.27 | 7   | 21.8 | 15.8 | 59.1 | 2.5 | 17.5 | 12.5 |
| Average | 2.37 | 5.47 | 5.58 | 8.5 | 58.8 | 46.0 | 135  | 24  | 44   | 32   |
| Max     | 20.5 | 12.1 | 57.5 | 9.2 | 150  | 78.3 | 198  | 70  | 62.5 | 57.5 |
| Number  | 24   | 24   | 24   | 24  | 24   | 24   | 24   | 24  | 24   | 24   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Northern Analytical Laboratories Inc. of Billings, MT
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-101R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2568.8                         | 2.5                          | 2566.3                            | 0.8             | 0.68          | 1                 | 7.6       | 5.5            | 5.79 | 100                       | 6                | 44               | 50               | Silty Clay      |
| 2.5                       | 2566.3                         | 5                            | 2563.8                            | 24.8            | 7.2           | 58.3              | 7.4       | 42.2           | 6.55 | 100                       | 2                | 41               | 57               | Silty Clay      |
| 5                         | 2563.8                         | 7.5                          | 2561.3                            | 22.2            | 8.5           | 48.9              | 3.3       | 66.5           | 11.2 | 83                        | 58               | 23               | 19               | Sandy Loam      |
| 7.5                       | 2561.3                         | 10                           | 2558.8                            | 22.8            | 6             | 17.6              | 3.4       | 43.4           | 9.66 | 120                       | 76               | 16               | 8                | Sandy Loam      |
| 10                        | 2558.8                         | 12.5                         | 2556.3                            | 6.4             | 2.9           | 6.6               | 3.9       | 21.2           | 8.3  | 100                       | 16               | 34               | 50               | Clay            |
| 12.5                      | 2556.3                         | 15                           | 2553.8                            | 4.6             | 2.3           | 4.9               | 4.8       | 15.1           | 6.92 | 100                       | 2                | 48               | 50               | Silty Clay      |
| 15                        | 2553.8                         | 17.5                         | 2551.3                            | 5.1             | 2.3           | 6.9               | 8.1       | 16.5           | 6.73 | 100                       | 1                | 46               | 54               | Silty Clay      |
| 17.5                      | 2551.3                         | 20                           | 2548.8                            | 11              | 3.3           | 13.4              | 7.7       | 17.7           | 5.05 | 130                       |                  |                  |                  |                 |
| 20                        | 2548.8                         | 25                           | 2543.8                            | 11.5            | 3.8           | 15.6              | 6.4       | 22.1           | 6    | 100                       | 8                | 42               | 50               | Silty Clay      |
| 25                        | 2543.8                         | 30                           | 2538.8                            | 21.8            | 5.5           | 29.2              | 6.2       | 32.4           | 6.41 | 81                        | 50               | 22               | 28               | Sandy Clay Loam |
| 30                        | 2538.8                         | 35                           | 2533.8                            | 5.2             | 2.5           | 6.1               | 7.9       | 17.2           | 7.22 | 63                        | 12               | 68               | 20               | Silt Loam       |
| 35                        | 2533.8                         | 40                           | 2528.8                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 40                        | 2528.8                         | 45                           | 2523.8                            | 1               | 1.9           | 1.1               | 8.4       | 18.5           | 18   | 110                       | 6                | 62               | 32               | Silty Clay Loam |
| 45                        | 2523.8                         | 50                           | 2518.8                            | 0.7             | 1.9           | 0.5               | 8.7       | 18.9           | 24.6 | 120                       | 6                | 64               | 30               | Silty Clay Loam |
| 50                        | 2518.8                         | 55                           | 2513.8                            | 0.5             | 1.9           | 0.3               | 8.8       | 20.2           | 30.6 | 140                       | 10               | 60               | 30               | Silty Clay Loam |
| 55                        | 2513.8                         | 60                           | 2508.8                            | 0.6             | 2.9           | 0.5               | 8.9       | 31             | 41.4 | 78                        | 54               | 30               | 16               | Sandy Loam      |
| 60                        | 2508.8                         | 65                           | 2503.8                            | 0.5             | 2.8           | 0.3               | 9         | 29.1           | 45.3 | 79                        | 64               | 18               | 18               | Sandy Loam      |
| 65                        | 2503.8                         | 70                           | 2498.8                            | 0.5             | 3             | 0.4               | 8.9       | 31.8           | 46.9 | 65                        | 70               | 14               | 16               | Sandy Loam      |
| 70                        | 2498.8                         | 75                           | 2493.8                            | 0.6             | 3.7           | 0.5               | 8.8       | 41.7           | 55.8 | 59                        | 74               | 12               | 14               | Sandy Loam      |
| 75                        | 2493.8                         | 80                           | 2488.8                            | 0.6             | 3.8           | 0.8               | 7.7       | 41.2           | 48.5 | 62                        | 76               | 13               | 11               | Sandy Loam      |
| 90                        | 2478.8                         | 95                           | 2473.8                            | 0.4             | 2.1           | 0.5               | 8.5       | 23.2           | 34.9 | 150                       | 12               | 46               | 42               | Silty Clay      |
| 95                        | 2473.8                         | 100                          | 2468.8                            | 0.2             | 1.4           | 0.3               | 9         | 13.6           | 28.9 | 120                       | 4                | 63               | 33               | Silty Clay Loam |
| 100                       | 2468.8                         | 105                          | 2463.8                            | 0.1             | 1.5           | 0.1               | 9.2       | 16.5           | 46.7 | 130                       | 4                | 62               | 34               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.1  | 0.68 | 0.1  | 3.3  | 5.5   | 5.05  | 59    | 1  | 12 | 8  |
| Average | 6.45 | 3.27 | 9.72 | 7.39 | 26.61 | 22.79 | 99.55 | 29 | 39 | 32 |
| Max     | 24.8 | 8.5  | 58.3 | 9.2  | 66.5  | 55.8  | 150   | 76 | 68 | 57 |
| Number  | 22   | 22   | 22   | 22   | 22    | 22    | 22    | 21 | 21 | 21 |

Depth to Coal: 80'

Statistical Summary Above Coal

|         |      |      |      |     |      |      |     |    |    |    |
|---------|------|------|------|-----|------|------|-----|----|----|----|
| Min     | 0.5  | 0.68 | 0.3  | 3.3 | 5.5  | 5.05 | 59  | 1  | 12 | 8  |
| Average | 7    | 4    | 11   | 7   | 28   | 21   | 94  | 33 | 37 | 31 |
| Max     | 24.8 | 8.5  | 58.3 | 9   | 66.5 | 55.8 | 140 | 76 | 68 | 57 |
| Number  | 19   | 19   | 19   | 19  | 19   | 19   | 19  | 18 | 18 | 18 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.55

OVERBURDEN ANALYSIS DATA FOR SHOB-102R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2540.4                         | 2.5                          | 2537.9                            | 4               | 0.86          | 3.1               | 6.7       | 1.3            | 0.68 | 52                        |                  |                  |                  |                 |
| 2.5                       | 2537.9                         | 5                            | 2535.4                            | 5.3             | 3.9           | 14.6              | 8.1       | 29.9           | 9.48 | 50                        | 16               | 59               | 25               | Silt Loam       |
| 5                         | 2535.4                         | 7.5                          | 2532.9                            | 12.5            | 6.4           | 21.5              | 8.1       | 57             | 13.8 | 50                        | 31               | 49               | 20               | Loam            |
| 7.5                       | 2532.9                         | 10                           | 2530.4                            | 21.2            | 9.5           | 39.7              | 8.1       | 93.2           | 16.9 | 81                        | 9                | 75               | 16               | Silt Loam       |
| 10                        | 2530.4                         | 12.5                         | 2527.9                            | 21.7            | 9.6           | 39.6              | 8         | 92.1           | 16.6 | 100                       | 1                | 44               | 56               | Silty Clay      |
| 12.5                      | 2527.9                         | 15                           | 2525.4                            | 10.2            | 6.8           | 20.3              | 8.1       | 60.3           | 15.4 | 110                       | 2                | 64               | 34               | Silty Clay Loam |
| 15                        | 2525.4                         | 17.5                         | 2522.9                            | 3.7             | 5.2           | 9.8               | 8.3       | 49             | 18.8 | 130                       | 14               | 59               | 27               | Silty Clay Loam |
| 17.5                      | 2522.9                         | 20                           | 2520.4                            | 7.5             | 6.2           | 15                | 8.1       | 58.7           | 17.5 | 63                        | 6                | 64               | 30               | Silty Clay Loam |
| 20                        | 2520.4                         | 25                           | 2515.4                            | 11.1            | 7.8           | 19.8              | 8.2       | 77.7           | 19.8 | 79                        | 29               | 43               | 28               | Clay Loam       |
| 25                        | 2515.4                         | 30                           | 2510.4                            | 8.9             | 7.5           | 15.3              | 8.1       | 80.9           | 23.3 | 110                       | 30               | 43               | 27               | Clay Loam       |
| 30                        | 2510.4                         | 35                           | 2505.4                            | 2.9             | 5.9           | 4.8               | 8.3       | 62.7           | 32   | 78                        | 1                | 54               | 46               | Silty Clay      |
| 50                        | 2490.4                         | 55                           | 2485.4                            | 0.4             | 1.9           | 0.3               | 8.8       | 19.3           | 33.9 | 70                        | 1                | 59               | 40               | Silty Clay      |
| 55                        | 2485.4                         | 60                           | 2480.4                            | 0.1             | 1.4           | < 0.08            | 9.1       | 14.2           | 47.8 | 130                       | 1                | 60               | 40               | Silty Clay      |
| 60                        | 2480.4                         | 65                           | 2475.4                            | 0.5             | 1.4           | 0.9               | 9.3       | 13.6           | 16.4 | 92                        | 7                | 64               | 29               | Silty Clay Loam |

Statistical Summary

|         |      |      |        |      |       |       |       |    |    |    |
|---------|------|------|--------|------|-------|-------|-------|----|----|----|
| Min     | 0.1  | 0.86 | < 0.08 | 6.7  | 1.3   | 0.68  | 50    | 1  | 43 | 16 |
| Average | 7.86 | 5.31 | 14.62  | 8.24 | 50.71 | 20.17 | 85.36 | 11 | 57 | 32 |
| Max     | 21.7 | 9.6  | 39.7   | 9.3  | 93.2  | 47.8  | 130   | 31 | 75 | 56 |
| Number  | 14   | 14   | 14     | 14   | 14    | 14    | 14    | 13 | 13 | 13 |

Depth to Coal: 35'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 2.9  | 0.86 | 3.1   | 6.7  | 1.3   | 0.68  | 50    | 1  | 43 | 16 |
| Average | 9.91 | 6.33 | 18.50 | 8.01 | 60.25 | 16.75 | 82.09 | 14 | 55 | 31 |
| Max     | 21.7 | 9.6  | 39.7  | 8.3  | 93.2  | 32    | 130   | 31 | 75 | 56 |
| Number  | 11   | 11   | 11    | 11   | 11    | 11    | 11    | 10 | 10 | 10 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY
- In calculating arithmetic mean < 0.08 is 0.04

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.56

OVERBURDEN ANALYSIS DATA FOR SHOB-103R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2570.3                         | 2.5                          | 2567.8                            | 2.8             | 1             | 4.1               | 7.8       | 4.2            | 2.24 | 59                        | 14               | 46               | 40               | Silty Clay      |
| 2.5                       | 2567.8                         | 5                            | 2565.3                            | 4.2             | 1.8           | 6.5               | 7.9       | 9.2            | 3.99 | 41                        | 54               | 24               | 22               | Sandy Clay Loam |
| 5                         | 2565.3                         | 7.5                          | 2562.8                            | 24.3            | 5.5           | 34.8              | 7.2       | 28.5           | 5.24 | 44                        | 54               | 24               | 22               | Sandy Clay Loam |
| 7.5                       | 2562.8                         | 10                           | 2560.3                            | 21.7            | 13            | 96.2              | 3.7       | 115            | 15   | 62                        | 56               | 28               | 16               | Sandy Loam      |
| 12.5                      | 2557.8                         | 15                           | 2555.3                            | 22.3            | 8.4           | 45.6              | 3.9       | 67.3           | 11.6 | 85                        | 2                | 42               | 56               | Silty Clay      |
| 15                        | 2555.3                         | 17.5                         | 2552.8                            | 22              | 12            | 77.3              | 3.7       | 111            | 15.8 | 56                        | 18               | 44               | 38               | Silty Clay Loam |
| 17.5                      | 2552.8                         | 20                           | 2550.3                            | 22.5            | 7.9           | 42                | 4.4       | 64.8           | 11.4 | 84                        | 2                | 56               | 42               | Silty Clay      |
| 20                        | 2550.3                         | 25                           | 2545.3                            | 20.2            | 8.3           | 39.5              | 6.7       | 72.8           | 13.3 | 120                       | 2                | 33               | 65               | Clay            |
| 25                        | 2545.3                         | 30                           | 2540.3                            | 12.4            | 7.9           | 25.2              | 6.5       | 77.4           | 17.8 | 83                        | 30               | 34               | 36               | Clay Loam       |
| 30                        | 2540.3                         | 35                           | 2535.3                            | 3.6             | 5             | 4.6               | 8.3       | 52.1           | 25.7 | 80                        | 1                | 73               | 26               | Silt Loam       |
| 35                        | 2535.3                         | 40                           | 2530.3                            | 1.8             | 3.2           | 2                 | 8.5       | 31.9           | 23.3 | 120                       | 2                | 46               | 52               | Silty Clay      |
| 40                        | 2530.3                         | 45                           | 2525.3                            | 0.9             | 3.2           | 0.5               | 8.9       | 33             | 38.8 | 110                       | 12               | 62               | 26               | Silt Loam       |
| 45                        | 2525.3                         | 50                           | 2520.3                            | 0.7             | 3.3           | 0.6               | 8.8       | 36             | 44.8 | 130                       | 4                | 60               | 36               | Silty Clay Loam |
| 50                        | 2520.3                         | 55                           | 2515.3                            | 0.5             | 2.6           | 0.3               | 9         | 27.2           | 40.8 | 140                       | 8                | 56               | 36               | Silty Clay Loam |
| 55                        | 2515.3                         | 60                           | 2510.3                            | 0.4             | 2.5           | 0.3               | 9.1       | 26.3           | 42.3 | 97                        | 50               | 30               | 20               | Loam            |
| 60                        | 2510.3                         | 65                           | 2505.3                            | 0.4             | 2.7           | 0.4               | 9.2       | 28.6           | 46.1 | 87                        | 48               | 34               | 18               | Loam            |
| 65                        | 2505.3                         | 70                           | 2500.3                            | 0.2             | 2             | 0.2               | 9.2       | 20.8           | 51.2 | 94                        | 46               | 28               | 26               | Loam            |
| 70                        | 2500.3                         | 75                           | 2495.3                            | 0.2             | 1.8           | 0.2               | 9         | 19             | 39.6 | 130                       | 23               | 57               | 20               | Silt Loam       |
| 90                        | 2480.3                         | 95                           | 2475.3                            | 0.2             | 1.9           | 0.2               | 8.4       | 21.5           | 43.3 | 150                       | 10               | 50               | 40               | Silty Clay      |
| 95                        | 2475.3                         | 100                          | 2470.3                            | 0.2             | 1.4           | 0.1               | 9.1       | 15.2           | 39.7 | 150                       | 1                | 53               | 46               | Silty Clay      |
| 100                       | 2470.3                         | 105                          | 2465.3                            | 0.3             | 1.8           | 0.4               | 9.2       | 19.4           | 33.5 | 110                       | 20               | 56               | 24               | Silt Loam       |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 1    | 0.1   | 3.7  | 4.2   | 2.24  | 41    | 1  | 24 | 16 |
| Average | 7.70 | 4.63 | 18.14 | 7.55 | 41.96 | 26.93 | 96.76 | 22 | 45 | 34 |
| Max     | 24.3 | 13   | 96.2  | 9.2  | 115   | 51.2  | 150   | 56 | 73 | 65 |
| Number  | 21   | 21   | 21    | 21   | 21    | 21    | 21    | 21 | 21 | 21 |

Depth to Coal: 75'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 1    | 0.2   | 3.7  | 4.2   | 2.24  | 41    | 1  | 24 | 16 |
| Average | 8.95 | 5.12 | 21.13 | 7.32 | 45.84 | 24.94 | 90.11 | 24 | 43 | 33 |
| Max     | 24.3 | 13   | 96.2  | 9.2  | 115   | 51.2  | 140   | 56 | 73 | 65 |
| Number  | 18   | 18   | 18    | 18   | 18    | 18    | 18    | 18 | 18 | 18 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-104R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2544.5                         | 2.5                          | 2542.0                            | 2.6             | 0.67          | 2.9               | 7.5       | 1.9            | 1.15 | 84                        |                  |                  |                  |                 |
| 2.5                       | 2542.0                         | 5                            | 2539.5                            | 26.4            | 4             | 27.1              | 7.5       | 11.3           | 2.19 | 78                        | 20               | 39               | 41               | Clay            |
| 5                         | 2539.5                         | 7.5                          | 2537.0                            | 23.7            | 5.8           | 44                | 7.4       | 31.2           | 5.36 | 66                        | 28               | 40               | 32               | Clay Loam       |
| 7.5                       | 2537.0                         | 10                           | 2534.5                            | 24.1            | 8.2           | 65.5              | 6.9       | 57.7           | 8.62 | 67                        | 28               | 43               | 29               | Clay Loam       |
| 15                        | 2529.5                         | 17.5                         | 2527.0                            | 23.6            | 15            | 162               | 3.3       | 125            | 12.9 | 86                        | 44               | 25               | 31               | Clay Loam       |
| 17.5                      | 2527.0                         | 20                           | 2524.5                            | 22.2            | 9.9           | 83                | 3.6       | 73.6           | 10.2 | 82                        | 6                | 49               | 45               | Silty Clay      |
| 20                        | 2524.5                         | 25                           | 2519.5                            | 22.2            | 6.4           | 33.3              | 5.9       | 45.4           | 8.63 | 110                       |                  |                  |                  |                 |
| 25                        | 2519.5                         | 30                           | 2514.5                            | 4.3             | 5.2           | 8.5               | 6.8       | 50.9           | 20.1 | 110                       | 10               | 43               | 47               | Silty Clay      |
| 30                        | 2514.5                         | 35                           | 2509.5                            | 10.8            | 6.7           | 13.3              | 7.4       | 66.9           | 19.3 | 61                        | 16               | 57               | 27               | Silty Clay Loam |
| 35                        | 2509.5                         | 40                           | 2504.5                            | 3.1             | 4.9           | 3.9               | 8.5       | 52.2           | 27.9 | 72                        | 8                | 65               | 27               | Silty Clay Loam |
| 40                        | 2504.5                         | 45                           | 2499.5                            | 2.9             | 5.3           | 3.1               | 8.3       | 59.3           | 34.4 | 94                        | 1                | 58               | 42               | Silty Clay      |
| 45                        | 2499.5                         | 50                           | 2494.5                            | 0.7             | 3.2           | 0.8               | 8.5       | 33.7           | 40   | 100                       | 16               | 47               | 37               | Silty Clay Loam |
| 50                        | 2494.5                         | 55                           | 2489.5                            | 0.4             | 2.6           | 0.4               | 8.8       | 27.7           | 45.6 | 130                       | 18               | 47               | 35               | Silty Clay Loam |
| 55                        | 2489.5                         | 60                           | 2484.5                            | 0.7             | 3.4           | 0.6               | 8.9       | 37.3           | 47.4 | 93                        | 44               | 31               | 25               | Loam            |
| 60                        | 2484.5                         | 65                           | 2479.5                            | 0.7             | 4.6           | 0.8               | 9         | 54.5           | 63.2 | 100                       | 36               | 39               | 25               | Loam            |
| 65                        | 2479.5                         | 70                           | 2474.5                            | 0.4             | 2.8           | 0.4               | 8.8       | 30.1           | 46.3 | 80                        | 56               | 23               | 21               | Sandy Clay Loam |
| 70                        | 2474.5                         | 75                           | 2469.5                            | 0.4             | 2.5           | 0.3               | 9.1       | 26.9           | 47.6 | 71                        | 61               | 23               | 16               | Silt Loam       |
| 75                        | 2469.5                         | 80                           | 2464.5                            | 0.4             | 2.6           | 0.3               | 9.1       | 26.7           | 43.7 | 64                        | 68               | 15               | 17               | Silt Loam       |
| 80                        | 2464.5                         | 85                           | 2459.5                            | 5               | 7.8           | 5.5               | 7.9       | 93.7           | 40.9 | 49                        | 68               | 15               | 17               | Silt Loam       |
| 100                       | 2444.5                         | 105                          | 2439.5                            | 0.3             | 2.3           | 0.3               | 8.3       | 23.9           | 43.2 | 150                       | 2                | 41               | 57               | Silty Clay      |
| 105                       | 2439.5                         | 110                          | 2434.5                            | 0.1             | 1.7           | 0.1               | 8.7       | 18.1           | 57.4 | 120                       | 1                | 53               | 47               | Silty Clay      |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.1  | 0.67 | 0.1   | 3.3  | 1.9   | 1.15  | 49    | 1  | 15 | 16 |
| Average | 8.33 | 5.03 | 21.72 | 7.63 | 45.14 | 29.81 | 88.90 | 28 | 40 | 33 |
| Max     | 26.4 | 15   | 162   | 9.1  | 125   | 63.2  | 150   | 68 | 65 | 57 |
| Number  | 21   | 21   | 21    | 21   | 21    | 21    | 21    | 19 | 19 | 19 |

Depth to Coal: 85'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.4  | 0.67 | 0.3   | 3.3  | 1.9   | 1.15  | 49    | 1  | 15 | 16 |
| Average | 9.19 | 5.35 | 23.98 | 7.54 | 47.68 | 27.66 | 84.05 | 31 | 39 | 30 |
| Max     | 26.4 | 15   | 162   | 9.1  | 125   | 63.2  | 130   | 68 | 65 | 47 |
| Number  | 19   | 19   | 19    | 19   | 19    | 19    | 19    | 17 | 17 | 17 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.58

OVERBURDEN ANALYSIS DATA FOR SHOB-105R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2589.1                         | 2.5                          | 2586.6                            | 26.3            | 2.9           | 12.1              | 6.9       | 2.2            | 0.51 | 64                        |                  |                  |                  |                 |
| 2.5                       | 2586.6                         | 5                            | 2584.1                            | 24.4            | 4.6           | 37.8              | 4.2       | 9              | 1.61 | 73                        | 15               | 37               | 48               | Clay            |
| 5                         | 2584.1                         | 7.5                          | 2581.6                            | 22.4            | 7.4           | 55.7              | 3.5       | 41.2           | 6.59 | 80                        | 49               | 34               | 17               | Loam            |
| 10                        | 2579.1                         | 12.5                         | 2576.6                            | 18.2            | 4.5           | 22.3              | 3.9       | 22.1           | 4.92 | 76                        | 1                | 49               | 51               | Silty Clay      |
| 12.5                      | 2576.6                         | 15                           | 2574.1                            | 24.1            | 5.7           | 35.6              | 4.9       | 31.8           | 5.82 | 96                        | 10               | 37               | 53               | Clay            |
| 15                        | 2574.1                         | 17.5                         | 2571.6                            | 16.7            | 5.1           | 25                | 5.7       | 31.2           | 6.83 | 98                        | 4                | 41               | 55               | Silty Clay      |
| 17.5                      | 2571.6                         | 20                           | 2569.1                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 20                        | 2569.1                         | 25                           | 2564.1                            | 12.1            | 8.1           | 22.5              | 6.5       | 78.3           | 18.8 | 100                       | 6                | 29               | 65               | Clay            |
| 25                        | 2564.1                         | 30                           | 2559.1                            | 2.5             | 4             | 2.9               | 8.1       | 40             | 24.3 | 81                        | 1                | 62               | 38               | Silty Clay Loam |
| 30                        | 2559.1                         | 35                           | 2554.1                            | 6.4             | 4.3           | 7.6               | 7.3       | 36.1           | 13.6 | 45                        | 24               | 56               | 20               | Silt Loam       |
| 35                        | 2554.1                         | 40                           | 2549.1                            | 0.9             | 2.5           | 0.8               | 8.3       | 23.8           | 26   | 56                        | 2                | 70               | 28               | Silty Clay Loam |
| 40                        | 2549.1                         | 45                           | 2544.1                            | 0.8             | 2.8           | 0.8               | 7.8       | 27.4           | 30.7 | 84                        | 3                | 47               | 50               | Silty Clay      |
| 45                        | 2544.1                         | 50                           | 2539.1                            | 11.1            | 5.6           | 7.5               | 7.7       | 52.8           | 17.3 | 21                        | 66               | 24               | 10               | Silt Loam       |
| 50                        | 2539.1                         | 55                           | 2534.1                            | 4.5             | 6.3           | 4                 | 8.2       | 68.4           | 33.1 | 42                        | 42               | 37               | 21               | Loam            |
| 55                        | 2534.1                         | 60                           | 2529.1                            | 0.6             | 3.1           | 0.5               | 8.5       | 29.8           | 39.2 | 90                        | 10               | 56               | 34               | Silty Clay Loam |
| 60                        | 2529.1                         | 65                           | 2524.1                            | 0.3             | 2.7           | 0.3               | 8.5       | 28.1           | 49.7 | 110                       | 4                | 60               | 36               | Silty Clay Loam |
| 65                        | 2524.1                         | 70                           | 2519.1                            | 0.3             | 2.2           | 0.3               | 9.1       | 23.9           | 42.4 | 100                       | 24               | 53               | 23               | Silt Loam       |
| 70                        | 2519.1                         | 75                           | 2514.1                            | 0.2             | 1.9           | 0.2               | 8.9       | 21             | 50.8 | 140                       | 2                | 52               | 46               | Silty Clay      |
| 75                        | 2514.1                         | 80                           | 2509.1                            | 0.4             | 2.1           | 0.3               | 8.5       | 24             | 42.2 | 110                       | 2                | 64               | 34               | Silty Clay Loam |
| 95                        | 2494.1                         | 100                          | 2489.1                            | 0.7             | 3             | 0.4               | 7.9       | 34.8           | 47.6 | 100                       | 19               | 48               | 33               | Silty Clay Loam |
| 100                       | 2489.1                         | 105                          | 2484.1                            | 0.3             | 1.8           | 0.2               | 8.8       | 21.5           | 41.4 | 110                       | 1                | 64               | 36               | Silty Clay Loam |
| 105                       | 2484.1                         | 110                          | 2479.1                            | 0.2             | 1.7           | 0.2               | 9         | 19.2           | 44.3 | 140                       | 1                | 55               | 44               | Silty Clay      |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 1.7  | 0.2   | 3.5  | 2.2   | 0.51  | 21    | 1  | 24 | 10 |
| Average | 8.26 | 3.92 | 11.29 | 7.25 | 31.74 | 26.08 | 86.48 | 14 | 49 | 37 |
| Max     | 26.3 | 8.1  | 55.7  | 9.1  | 78.3  | 50.8  | 140   | 66 | 70 | 65 |
| Number  | 21   | 21   | 21    | 21   | 21    | 21    | 21    | 20 | 20 | 20 |

Depth to Coal: 80'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 1.9  | 0.2   | 3.5  | 2.2   | 0.51  | 21    | 1  | 24 | 10 |
| Average | 9.57 | 4.21 | 13.12 | 7.03 | 32.84 | 23.02 | 81.44 | 16 | 48 | 37 |
| Max     | 26.3 | 8.1  | 55.7  | 9.1  | 78.3  | 50.8  | 140   | 66 | 70 | 65 |
| Number  | 18   | 18   | 18    | 18   | 18    | 18    | 18    | 17 | 17 | 17 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.59

OVERBURDEN ANALYSIS DATA FOR SHOB-106R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2575.8                         | 2.5                          | 2573.3                            | 2               | 0.48          | 1.8               | 7.4       | 1              | 0.71 | 69                        |                  |                  |                  |                 |
| 2.5                       | 2573.3                         | 5                            | 2570.8                            | 27.5            | 3.5           | 18.7              | 7.2       | 4.7            | 0.98 | 90                        | 1                | 35               | 65               | Clay            |
| 5                         | 2570.8                         | 7.5                          | 2568.3                            | 23.8            | 4.7           | 26.3              | 5         | 18             | 3.6  | 89                        | 1                | 45               | 55               | Silty Clay      |
| 7.5                       | 2568.3                         | 10                           | 2565.8                            | 22.3            | 7.3           | 26.8              | 4.1       | 55             | 11.1 | 59                        | 13               | 54               | 33               | Silty Clay Loam |
| 10                        | 2565.8                         | 12.5                         | 2563.3                            | 23.8            | 8.3           | 27.3              | 4.7       | 70.3           | 13.9 | 89                        | 3                | 54               | 43               | Silty Clay      |
| 12.5                      | 2563.3                         | 15                           | 2560.8                            | 11.1            | 5.8           | 15.8              | 5.5       | 45.6           | 12.4 | 110                       | 1                | 58               | 41               | Silty Clay      |
| 15                        | 2560.8                         | 17.5                         | 2558.3                            | 3.4             | 3.4           | 5.5               | 7.1       | 26.6           | 12.6 | 120                       | 1                | 53               | 47               | Silty Clay      |
| 17.5                      | 2558.3                         | 20                           | 2555.8                            | 2               | 2.7           | 3.2               | 7.6       | 20.8           | 12.9 | 130                       | 1                | 53               | 47               | Silty Clay      |
| 20                        | 2555.8                         | 25                           | 2550.8                            | 4.8             | 3.9           | 7.7               | 7.1       | 30.3           | 12.1 | 100                       | 7                | 38               | 55               | Clay            |
| 25                        | 2550.8                         | 30                           | 2545.8                            | 1.7             | 2.4           | 1.9               | 8.2       | 20             | 14.9 | 94                        | 2                | 59               | 39               | Silty Clay Loam |
| 30                        | 2545.8                         | 35                           | 2540.8                            | 1.3             | 2.8           | 1.6               | 8.1       | 25             | 20.7 | 61                        | 1                | 73               | 27               | Silty Clay Loam |
| 35                        | 2540.8                         | 40                           | 2535.8                            | 0.5             | 2.2           | 0.6               | 7.7       | 21.5           | 28.3 | 90                        | 4                | 46               | 50               | Silty Clay      |
| 40                        | 2535.8                         | 45                           | 2530.8                            | 0.3             | 2.2           | 0.3               | 8.5       | 20.9           | 37.5 | 76                        | 1                | 65               | 35               | Silty Clay Loam |
| 45                        | 2530.8                         | 50                           | 2525.8                            | 0.4             | 2.8           | 0.4               | 8.4       | 25.6           | 39.7 | 87                        | 4                | 55               | 41               | Silty Clay      |
| 50                        | 2525.8                         | 55                           | 2520.8                            | 0.3             | 1.8           | 0.2               | 8.5       | 17.6           | 37.4 | 110                       | 4                | 54               | 42               | Silty Clay      |
| 55                        | 2520.8                         | 60                           | 2515.8                            | 0.2             | 1.6           | 0.1               | 8.7       | 16.5           | 42.2 | 120                       | 4                | 67               | 29               | Silty Clay Loam |
| 60                        | 2515.8                         | 65                           | 2510.8                            | 0.2             | 1.4           | 0.1               | 8.9       | 13.8           | 36.2 | 140                       | 15               | 46               | 39               | Silty Clay Loam |
| 65                        | 2510.8                         | 70                           | 2505.8                            | 0.2             | 1.6           | 0.1               | 9.1       | 15.2           | 39   | 130                       | 13               | 54               | 33               | Silty Clay Loam |
| 70                        | 2505.8                         | 75                           | 2500.8                            | 0.2             | 1.9           | 0.2               | 7.8       | 20.1           | 45   | 110                       | 21               | 44               | 35               | Clay Loam       |
| 90                        | 2485.8                         | 95                           | 2480.8                            | 0.1             | 1.2           | <0.08             | 8.3       | 10.7           | 34.3 | 190                       | 9                | 42               | 49               | Silty Clay      |
| 95                        | 2480.8                         | 100                          | 2475.8                            | 0.1             | 0.99          | <0.08             | 9.2       | 9.7            | 34.8 | 230                       | 1                | 45               | 54               | Silty Clay      |
| 100                       | 2475.8                         | 105                          | 2470.8                            | 0.1             | 1.4           | <0.08             | 9.2       | 13.3           | 43.7 | 140                       | 13               | 64               | 23               | Silt Loam       |

Statistical Summary

|         |      |      |       |      |       |       |        |    |    |    |
|---------|------|------|-------|------|-------|-------|--------|----|----|----|
| Min     | 0.1  | 0.48 | <0.08 | 4.1  | 1     | 0.71  | 59     | 1  | 35 | 23 |
| Average | 5.74 | 2.93 | 6.31  | 7.56 | 22.83 | 24.27 | 110.64 | 6  | 53 | 42 |
| Max     | 27.5 | 8.3  | 27.3  | 9.2  | 70.3  | 45    | 230    | 21 | 73 | 65 |
| Number  | 22   | 22   | 22    | 22   | 22    | 22    | 22     | 21 | 21 | 21 |

Depth to Coal: 75'

Statistical Summary Above Coal

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 0.48 | 0.1  | 4.1  | 1     | 0.71  | 59    | 1  | 35 | 27 |
| Average | 6.63 | 3.20 | 7.29 | 7.35 | 24.66 | 22.17 | 98.63 | 5  | 53 | 42 |
| Max     | 27.5 | 8.3  | 27.3 | 9.1  | 70.3  | 45    | 140   | 21 | 73 | 65 |
| Number  | 19   | 19   | 19   | 19   | 19    | 19    | 19    | 18 | 18 | 18 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY
- In calculating arithmetic mean < 0.08 is summed to be 0.04

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.60

OVERBURDEN ANALYSIS DATA FOR SHOB-107R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2579.9                         | 2.5                          | 2577.4                            | 1.3             | 0.49          | 1.4               | 6.9       | 2              | 1.7  | 48                        | 33               | 34               | 33               | Clay Loam       |
| 2.5                       | 2577.4                         | 5                            | 2574.9                            | 1.1             | 0.95          | 1.9               | 8         | 6.3            | 5.12 | 68                        | 25               | 34               | 41               | Clay            |
| 5                         | 2574.9                         | 7.5                          | 2572.4                            | 8.2             | 5.8           | 32.3              | 8.3       | 39             | 8.66 | 54                        | 43               | 32               | 25               | Loam            |
| 7.5                       | 2572.4                         | 10                           | 2569.9                            | 21.5            | 8.6           | 68.7              | 8         | 54.6           | 8.13 | 53                        | 43               | 32               | 25               | Loam            |
| 10                        | 2569.9                         | 12.5                         | 2567.4                            | 26              | 11            | 99.7              | 5.2       | 74.6           | 9.41 | 82                        |                  |                  |                  |                 |
| 17.5                      | 2562.4                         | 20                           | 2559.9                            | 21.6            | 6.8           | 36.4              | 4.1       | 42.3           | 7.85 | 87                        | 23               | 32               | 45               | Clay            |
| 20                        | 2559.9                         | 25                           | 2554.9                            | 15.5            | 4.6           | 21.7              | 5.5       | 23.2           | 5.38 | 100                       | 9                | 42               | 49               | Silty Clay      |
| 25                        | 2554.9                         | 30                           | 2549.9                            | 8.9             | 4.7           | 13.9              | 7.8       | 34.1           | 10.1 | 92                        | 29               | 38               | 33               | Clay Loam       |
| 30                        | 2549.9                         | 35                           | 2544.9                            | 3               | 4.3           | 3.9               | 8.4       | 38.1           | 20.6 | 120                       | 5                | 60               | 35               | Silty Clay Loam |
| 35                        | 2544.9                         | 40                           | 2539.9                            | 0.5             | 2.3           | 0.5               | 8.4       | 20.6           | 29.5 | 110                       | 1                | 59               | 41               | Silty Clay      |
| 40                        | 2539.9                         | 45                           | 2534.9                            | 0.4             | 2.2           | 0.4               | 8.5       | 19.9           | 32.3 | 130                       | 1                | 39               | 61               | Clay            |
| 45                        | 2534.9                         | 50                           | 2529.9                            | 4.6             | 9.1           | 6.2               | 7         | 109            | 46.8 | 89                        | 57               | 22               | 21               | Sandy Clay Loam |
| 50                        | 2529.9                         | 55                           | 2524.9                            | 0.6             | 3.4           | 0.7               | 7.2       | 35.5           | 43.6 | 100                       | 16               | 37               | 47               | Clay            |
| 55                        | 2524.9                         | 60                           | 2519.9                            | 0.3             | 2.4           | 0.3               | 8.6       | 25.4           | 44.4 | 100                       | 9                | 54               | 37               | Silty Clay Loam |
| 60                        | 2519.9                         | 65                           | 2514.9                            | 1               | 3             | 0.9               | 8.7       | 32.3           | 32.9 | 100                       | 3                | 70               | 27               | Silty Clay Loam |
| 65                        | 2514.9                         | 70                           | 2509.9                            | 1.6             | 3.8           | 1.3               | 8         | 41.2           | 34   | 94                        | 1                | 65               | 35               | Silty Clay Loam |
| 70                        | 2509.9                         | 75                           | 2504.9                            | 0.5             | 2.6           | 0.4               | 8.7       | 27.2           | 39.5 | 110                       | 7                | 62               | 31               | Silty Clay Loam |
| 75                        | 2504.9                         | 80                           | 2499.9                            | 0.2             | 1.5           | 0.1               | 8.8       | 15.6           | 39.6 | 150                       | 3                | 50               | 47               | Silty Clay      |
| 80                        | 2499.9                         | 85                           | 2494.9                            | 0.2             | 1.7           | 0.2               | 8.7       | 18.3           | 45.4 | 160                       | 3                | 46               | 51               | Silty Clay      |
| 105                       | 2474.9                         | 110                          | 2469.9                            | 0.4             | 2.4           | 0.3               | 7.1       | 25.7           | 44.2 | 110                       | 35               | 38               | 27               | Clay Loam       |
| 110                       | 2469.9                         | 115                          | 2464.9                            | 0.4             | 2.6           | 0.4               | 8         | 27.3           | 43.3 | 64                        | 48               | 32               | 20               | Loam            |
| 115                       | 2464.9                         | 120                          | 2459.9                            | 0.4             | 3.2           | 0.4               | 8.5       | 35.3           | 55.6 | 48                        | 75               | 14               | 11               | Sandy Loam      |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 0.49 | 0.1   | 4.1  | 2     | 1.7   | 48    | 1  | 14 | 11 |
| Average | 5.37 | 3.97 | 13.27 | 7.65 | 33.98 | 27.64 | 94.05 | 22 | 42 | 35 |
| Max     | 26   | 11   | 99.7  | 8.8  | 109   | 55.6  | 160   | 75 | 70 | 61 |
| Number  | 22   | 22   | 22    | 22   | 22    | 22    | 22    | 21 | 21 | 21 |

Depth to Coal: 85'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 0.49 | 0.1   | 4.1  | 2     | 1.7   | 48    | 1  | 22 | 21 |
| Average | 6.16 | 4.17 | 15.31 | 7.62 | 34.69 | 24.47 | 97.21 | 17 | 45 | 38 |
| Max     | 26   | 11   | 99.7  | 8.8  | 109   | 46.8  | 160   | 57 | 70 | 61 |
| Number  | 19   | 19   | 19    | 19   | 19    | 19    | 19    | 18 | 18 | 18 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.61

OVERBURDEN ANALYSIS DATA FOR SHOB-108R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2560.4                         | 2.5                          | 2557.9                            | 2.5             | 0.59          | 1.8               | 7.2       | 2.2            | 1.51 | 77                        |                  |                  |                  |                 |
| 2.5                       | 2557.9                         | 5                            | 2555.4                            | 23              | 8.6           | 74.4              | 8         | 57.6           | 8.25 | 91                        | 1                | 53               | 47               | Silty Clay      |
| 5                         | 2555.4                         | 7.5                          | 2552.9                            | 21.8            | 9.8           | 86.5              | 7.8       | 71.2           | 9.67 | 110                       | 1                | 47               | 53               | Silty Clay      |
| 7.5                       | 2552.9                         | 10                           | 2550.4                            | 20.4            | 11            | 112               | 7.8       | 84.8           | 10.4 | 91                        | 1                | 53               | 47               | Silty Clay      |
| 10                        | 2550.4                         | 12.5                         | 2547.9                            | 22.3            | 12            | 118               | 8.1       | 95.6           | 11.4 | 89                        | 1                | 51               | 49               | Silty Clay      |
| 12.5                      | 2547.9                         | 15                           | 2545.4                            | 10.1            | 7.1           | 38.6              | 7.7       | 57.6           | 11.7 | 120                       | 1                | 32               | 68               | Clay            |
| 15                        | 2545.4                         | 17.5                         | 2542.9                            | 22.1            | 8.2           | 51.4              | 7.2       | 60.2           | 9.92 | 100                       | 1                | 41               | 59               | Silty Clay      |
| 17.5                      | 2542.9                         | 20                           | 2540.4                            | 24.3            | 10            | 76.4              | 4.5       | 82.8           | 11.7 | 74                        | 25               | 27               | 48               | Clay            |
| 20                        | 2540.4                         | 25                           | 2535.4                            | 10.5            | 6.3           | 10.9              | 7.8       | 59.8           | 18.3 | 76                        | 1                | 59               | 40               | Silty Clay      |
| 25                        | 2535.4                         | 30                           | 2530.4                            | 2.8             | 4.4           | 3.4               | 8.2       | 41.7           | 23.6 | 72                        | 13               | 61               | 26               | Silt Loam       |
| 30                        | 2530.4                         | 35                           | 2525.4                            | 0.8             | 2.8           | 0.9               | 8.4       | 27.6           | 30.3 | 120                       | 3                | 52               | 45               | Silty Clay      |
| 35                        | 2525.4                         | 40                           | 2520.4                            | 3.2             | 4.7           | 3.7               | 8.5       | 45.2           | 24.4 | 53                        | 33               | 46               | 21               | Loam            |
| 40                        | 2520.4                         | 45                           | 2515.4                            | 1.1             | 3.9           | 1.3               | 7.6       | 38.4           | 35.2 | 120                       | 9                | 50               | 41               | Silty Clay      |
| 45                        | 2515.4                         | 50                           | 2510.4                            | 0.3             | 2.6           | 0.3               | 9         | 24.5           | 45.6 | 120                       | 25               | 48               | 27               | Clay Loam       |
| 50                        | 2510.4                         | 55                           | 2505.4                            | 0.2             | 2.2           | 0.2               | 8.8       | 21.4           | 44.3 | 130                       | 19               | 41               | 40               | Silty Clay      |
| 55                        | 2505.4                         | 60                           | 2500.4                            | 0.2             | 1.9           | 0.2               | 9.1       | 20             | 42.6 | 140                       | 7                | 60               | 33               | Silty Clay Loam |
| 60                        | 2500.4                         | 65                           | 2495.4                            | 0.3             | 2.7           | 0.4               | 9.1       | 26.9           | 47.2 | 130                       | 15               | 55               | 30               | Silty Clay Loam |
| 85                        | 2475.4                         | 90                           | 2470.4                            | 0.2             | 1.6           | 0.2               | 8.3       | 18.3           | 40.5 | 140                       | 9                | 58               | 33               | Silty Clay Loam |
| 90                        | 2470.4                         | 95                           | 2465.4                            | 0.8             | 3.4           | 0.9               | 8.7       | 34.2           | 37.8 | 62                        | 64               | 21               | 15               | Sandy Loam      |
| 95                        | 2465.4                         | 100                          | 2460.4                            | 0.4             | 2.9           | 0.5               | 8.8       | 30.1           | 45.6 | 55                        | 76               | 13               | 11               | Sandy Loam      |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 0.59 | 0.2   | 4.5  | 2.2   | 1.51  | 53    | 1  | 13 | 11 |
| Average | 8.37 | 5.33 | 29.10 | 8.03 | 45.01 | 25.50 | 98.50 | 16 | 46 | 39 |
| Max     | 24.3 | 12   | 118   | 9.1  | 95.6  | 47.2  | 140   | 76 | 61 | 68 |
| Number  | 20   | 20   | 20    | 20   | 20    | 20    | 20    | 19 | 19 | 19 |

Depth to Coal: 65'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |        |    |    |    |
|---------|------|------|-------|------|-------|-------|--------|----|----|----|
| Min     | 0.2  | 0.59 | 0.2   | 4.5  | 2.2   | 1.51  | 53     | 1  | 27 | 21 |
| Average | 9.76 | 5.81 | 34.14 | 7.93 | 48.09 | 22.71 | 100.76 | 10 | 49 | 42 |
| Max     | 24.3 | 12   | 118   | 9.1  | 95.6  | 47.2  | 140    | 33 | 61 | 68 |
| Number  | 17   | 17   | 17    | 17   | 17    | 17    | 17     | 16 | 16 | 16 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.62

OVERBURDEN ANALYSIS DATA FOR SHOB-109R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2525.5                         | 2.5                          | 2523.0                            | 3.2             | 0.81          | 2.4               | 5.5       | 2.1            | 1.24 | 31                        | 65               | 21               | 14               | Sandy Loam      |
| 2.5                       | 2523.0                         | 5                            | 2520.5                            | 1.4             | 0.4           | 1                 | 6.6       | 1.1            | 1.02 | 32                        | 83               | 12               | 5                | Loamy Sand      |
| 5                         | 2520.5                         | 7.5                          | 2518.0                            | 1.4             | 0.31          | 0.7               | 6.8       | 0.8            | 0.77 | 31                        | 89               | 8                | 3                | Sand            |
| 7.5                       | 2518.0                         | 10                           | 2515.5                            | 1               | 0.24          | 0.7               | 7.1       | 0.6            | 0.62 | 33                        | 87               | 9                | 4                | Loamy Sand      |
| 10                        | 2515.5                         | 12.5                         | 2513.0                            | 7.1             | 2.9           | 5.5               | 7.6       | 20.3           | 8.08 | 30                        | 86               | 9                | 5                | Loamy Sand      |
| 12.5                      | 2513.0                         | 15                           | 2510.5                            | 1.2             | 0.34          | 1                 | 7.5       | 0.7            | 0.7  | 30                        | 89               | 7                | 4                | Sand            |
| 15                        | 2510.5                         | 17.5                         | 2508.0                            | 1.5             | 0.38          | 1.3               | 7.6       | 0.8            | 0.68 | 32                        | 90               | 6                | 4                | Sand            |
| 17.5                      | 2508.0                         | 20                           | 2505.5                            | 1.3             | 0.32          | 0.9               | 7.6       | 0.8            | 0.74 | 29                        | 86               | 9                | 5                | Loamy Sand      |
| 20                        | 2505.5                         | 25                           | 2500.5                            | 1.9             | 0.64          | 1.3               | 7.6       | 3.2            | 2.51 | 31                        | 85               | 9                | 6                | Loamy Sand      |
| 25                        | 2500.5                         | 30                           | 2495.5                            | 2.8             | 0.73          | 1.7               | 7.6       | 2.8            | 1.88 | 31                        | 77               | 16               | 7                | Sandy Loam      |
| 30                        | 2495.5                         | 35                           | 2490.5                            | 2.5             | 0.88          | 1.5               | 7.7       | 4.8            | 3.35 | 32                        | 85               | 9                | 6                | Loamy Sand      |
| 35                        | 2490.5                         | 40                           | 2485.5                            | 8.2             | 1.5           | 4.4               | 7.5       | 5.2            | 2.06 | 30                        | 87               | 7                | 6                | Loamy Sand      |
| 40                        | 2485.5                         | 45                           | 2480.5                            | 3.3             | 1             | 2                 | 7.4       | 5.4            | 3.33 | 32                        | 71               | 18               | 11               | Sandy Loam      |
| 45                        | 2480.5                         | 50                           | 2475.5                            | 3.6             | 0.85          | 1.9               | 7.4       | 3              | 1.81 | 33                        | 71               | 19               | 10               | Sandy Loam      |
| 50                        | 2475.5                         | 55                           | 2470.5                            | 5.3             | 1.1           | 3                 | 7.6       | 3.9            | 1.91 | 30                        | 71               | 19               | 10               | Sandy Loam      |
| 55                        | 2470.5                         | 60                           | 2465.5                            | 9.9             | 1.9           | 5.8               | 7.6       | 7.7            | 2.77 | 30                        | 73               | 18               | 9                | Sandy Loam      |
| 60                        | 2465.5                         | 65                           | 2460.5                            | 12              | 2             | 8                 | 7.4       | 5.4            | 1.69 | 36                        | 61               | 26               | 13               | Sandy Loam      |
| 65                        | 2460.5                         | 70                           | 2455.5                            | 4.5             | 1.5           | 3.5               | 7.3       | 8.1            | 4.08 | 37                        | 72               | 16               | 12               | Sandy Loam      |
| 90                        | 2435.5                         | 95                           | 2430.5                            | 0.4             | 1.4           | 0.6               | 8.2       | 14             | 19.1 | 130                       | 6                | 56               | 38               | Silty Clay Loam |
| 95                        | 2430.5                         | 100                          | 2425.5                            | 0.09            | 0.95          | 0.09              | 8.9       | 9.4            | 31.8 | 180                       | 3                | 55               | 42               | Silty Clay      |

Statistical Summary

|         |      |      |      |      |      |      |       |    |    |    |
|---------|------|------|------|------|------|------|-------|----|----|----|
| Min     | 0.09 | 0.24 | 0.09 | 5.5  | 0.6  | 0.62 | 29    | 3  | 6  | 3  |
| Average | 3.63 | 1.01 | 2.36 | 7.43 | 5.01 | 4.51 | 44.00 | 72 | 17 | 11 |
| Max     | 12   | 2.9  | 8    | 8.9  | 20.3 | 31.8 | 180   | 90 | 56 | 42 |
| Number  | 20   | 20   | 20   | 20   | 20   | 20   | 20    | 20 | 20 | 20 |

Depth to Coal: 70'

Statistical Summary Above Coal

|         |      |      |      |      |      |      |       |    |    |    |
|---------|------|------|------|------|------|------|-------|----|----|----|
| Min     | 1    | 0.24 | 0.7  | 5.5  | 0.6  | 0.62 | 29    | 61 | 6  | 3  |
| Average | 4.01 | 0.99 | 2.59 | 7.30 | 4.26 | 2.18 | 31.67 | 79 | 13 | 7  |
| Max     | 12   | 2.9  | 8    | 7.7  | 20.3 | 8.08 | 37    | 90 | 26 | 14 |
| Number  | 18   | 18   | 18   | 18   | 18   | 18   | 18    | 18 | 18 | 18 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.63

OVERBURDEN ANALYSIS DATA FOR SHOB-110R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2582.7                         | 2.5                          | 2580.2                            | 6.8             | 0.84          | 1.3               | 7         | 1              | 0.48 | 80                        | 1                | 55               | 44               | Silty Clay      |
| 2.5                       | 2580.2                         | 5                            | 2577.7                            | 19.5            | 7.4           | 45.7              | 4.4       | 54.3           | 9.51 | 59                        |                  |                  |                  |                 |
| 5                         | 2577.7                         | 7.5                          | 2575.2                            | 9.9             | 4.9           | 19.8              | 6         | 35.4           | 9.18 | 130                       | 1                | 56               | 44               | Silty Clay      |
| 7.5                       | 2575.2                         | 10                           | 2572.7                            | 20.5            | 8.3           | 39.4              | 7.4       | 69.8           | 12.8 | 79                        | 9                | 65               | 26               | Silt Loam       |
| 10                        | 2572.7                         | 12.5                         | 2570.2                            | 18.6            | 8.8           | 37.4              | 7.8       | 83             | 15.7 | 68                        | 15               | 64               | 21               | Silt Loam       |
| 12.5                      | 2570.2                         | 15                           | 2567.7                            | 21.2            | 9.1           | 37.4              | 8         | 85.3           | 15.8 | 77                        | 17               | 59               | 24               | Silt Loam       |
| 15                        | 2567.7                         | 17.5                         | 2565.2                            | 22.4            | 8.8           | 29.9              | 8.1       | 85.1           | 16.6 | 69                        | 34               | 44               | 22               | Loam            |
| 17.5                      | 2565.2                         | 20                           | 2562.7                            | 4.4             | 6.8           | 7.9               | 8.3       | 72.4           | 29.2 | 83                        | 43               | 37               | 20               | Loam            |
| 20                        | 2562.7                         | 25                           | 2557.7                            | 18              | 12            | 28.2              | 7.1       | 155            | 32.2 | 84                        | 32               | 40               | 28               | Clay Loam       |
| 25                        | 2557.7                         | 30                           | 2552.7                            | 2               | 5.1           | 2.9               | 8.6       | 53.2           | 34.1 | 71                        | 6                | 76               | 18               | Silt Loam       |
| 30                        | 2552.7                         | 35                           | 2547.7                            | 1.1             | 3.8           | 1.3               | 8.3       | 37.9           | 35.1 | 83                        | 3                | 61               | 36               | Silty Clay Loam |
| 35                        | 2547.7                         | 40                           | 2542.7                            | 1               | 3.8           | 1                 | 8.5       | 40.4           | 40.8 | 88                        | 7                | 65               | 28               | Silty Clay Loam |
| 40                        | 2542.7                         | 45                           | 2537.7                            | 1.4             | 3.5           | 1.1               | 8.5       | 34.5           | 30.8 | 59                        | 32               | 49               | 19               | Loam            |
| 45                        | 2537.7                         | 50                           | 2532.7                            | 0.3             | 2.2           | 0.3               | 8.7       | 21.3           | 37.2 | 110                       | 7                | 59               | 34               | Silty Clay Loam |
| 50                        | 2532.7                         | 55                           | 2527.7                            | 0.2             | 1.7           | 0.1               | 9.2       | 16.6           | 43.9 | 140                       | 7                | 66               | 27               | Silty Clay Loam |
| 55                        | 2527.7                         | 60                           | 2522.7                            | 0.1             | 1.4           | < 0.08            | 9.2       | 13.3           | 45.6 | 200                       | 1                | 51               | 49               | Silty Clay      |
| 60                        | 2522.7                         | 65                           | 2517.7                            | 0.1             | 1.9           | 0.1               | 9.3       | 19.9           | 53.9 | 110                       | 49               | 26               | 25               | Sandy Clay Loam |
| 65                        | 2517.7                         | 70                           | 2512.7                            | 0.2             | 2.6           | 0.2               | 9.2       | 26.7           | 60.3 | 85                        | 60               | 19               | 21               | Sandy Clay Loam |
| 70                        | 2512.7                         | 75                           | 2507.7                            | 0.6             | 3.8           | 0.4               | 8.5       | 43.1           | 62.6 | 86                        | 63               | 18               | 19               | Sandy Loam      |
| 90                        | 2492.7                         | 95                           | 2487.7                            | 0.2             | 1.6           | 0.2               | 8.8       | 18.5           | 44.2 | 150                       | 5                | 60               | 35               | Silty Clay Loam |
| 95                        | 2487.7                         | 100                          | 2482.7                            | 0.1             | 1.5           | 0.09              | 9.1       | 15.2           | 45.1 | 120                       | 3                | 74               | 23               | Silt Loam       |
| 100                       | 2482.7                         | 105                          | 2477.7                            | 0.1             | 1.3           | < 0.08            | 9.5       | 12.2           | 46.2 | 160                       | 10               | 64               | 26               | Silt Loam       |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.1  | 0.84 | <0.08 | 4.4  | 1     | 0.48  | 59    | 1  | 18 | 18 |
| Average | 6.76 | 4.60 | 11.58 | 8.16 | 45.19 | 32.79 | 99.59 | 19 | 53 | 28 |
| Max     | 22.4 | 12   | 45.7  | 9.5  | 155   | 62.6  | 200   | 63 | 76 | 49 |
| Number  | 22   | 22   | 22    | 22   | 22    | 22    | 22    | 21 | 21 | 21 |

Depth to Coal: 75'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.1  | 0.84 | <0.08 | 4.4  | 1     | 0.48  | 59    | 1  | 18 | 18 |
| Average | 7.81 | 5.09 | 14.13 | 8.01 | 49.91 | 30.83 | 92.68 | 22 | 51 | 28 |
| Max     | 22.4 | 12   | 45.7  | 9.3  | 155   | 62.6  | 200   | 63 | 76 | 49 |
| Number  | 19   | 19   | 18    | 19   | 19    | 19    | 19    | 18 | 18 | 18 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY
- In calculating arithmetic mean < 0.08 is 0.04

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.64

OVERBURDEN ANALYSIS DATA FOR SHOB-111R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2549.5                         | 2.5                          | 2547.0                            | 0.6             | 0.81          | 0.4               | 8         | 7.9            | 11   | 71                        | 1                | 54               | 45               | Silty Clay      |
| 2.5                       | 2547.0                         | 5                            | 2544.5                            | 13.4            | 7.7           | 26.7              | 8.3       | 70.1           | 15.6 | 87                        | 1                | 53               | 46               | Silty Clay      |
| 5                         | 2544.5                         | 7.5                          | 2542.0                            | 26              | 13            | 63                | 8.5       | 155            | 23.2 | 92                        | 3                | 50               | 47               | Silty Clay      |
| 7.5                       | 2542.0                         | 10                           | 2539.5                            | 22.4            | 12            | 45.2              | 8.5       | 128            | 22   | 110                       | 2                | 52               | 46               | Silty Clay      |
| 10                        | 2539.5                         | 12.5                         | 2537.0                            | 22.7            | 13            | 44.1              | 8.2       | 144            | 24.8 | 81                        | 1                | 55               | 45               | Silty Clay      |
| 12.5                      | 2537.0                         | 15                           | 2534.5                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 15                        | 2534.5                         | 17.5                         | 2532.0                            | 7.7             | 6.2           | 9.5               | 8.2       | 62.4           | 21.3 | 160                       | 1                | 58               | 42               | Silty Clay      |
| 17.5                      | 2532.0                         | 20                           | 2529.5                            | 17.7            | 9.6           | 20.4              | 8.1       | 102            | 23.3 | 96                        | 25               | 50               | 25               | Silt Loam       |
| 20                        | 2529.5                         | 25                           | 2524.5                            | 17.4            | 9.3           | 20.1              | 8.1       | 97.8           | 22.6 | 120                       | 21               | 48               | 31               | Clay Loam       |
| 25                        | 2524.5                         | 30                           | 2519.5                            | 4.5             | 6.4           | 8.9               | 8.2       | 64.4           | 24.9 | 140                       | 21               | 44               | 35               | Clay Loam       |
| 30                        | 2519.5                         | 35                           | 2514.5                            | 24.4            | 13            | 42.4              | 8.2       | 150            | 25.9 | 57                        | 59               | 18               | 23               | Sandy Clay Loam |
| 35                        | 2514.5                         | 40                           | 2509.5                            | 24              | 14            | 52.1              | 6.7       | 176            | 28.5 | 50                        | 73               | 12               | 15               | Sandy Loam      |
| 55                        | 2494.5                         | 60                           | 2489.5                            | 0.7             | 3.7           | 0.7               | 7.9       | 38.2           | 46.9 | 150                       | 23               | 48               | 29               | Clay Loam       |
| 60                        | 2489.5                         | 65                           | 2484.5                            | 0.2             | 1.9           | 0.2               | 9.1       | 19.6           | 45.6 | 200                       | 1                | 57               | 43               | Silty Clay      |
| 65                        | 2484.5                         | 70                           | 2479.5                            | 0.2             | 2.3           | 0.1               | 9.3       | 22.9           | 53.6 | 90                        | 31               | 52               | 17               | Silt Loam       |

Statistical Summary

|         |       |      |       |      |       |       |        |    |    |    |
|---------|-------|------|-------|------|-------|-------|--------|----|----|----|
| Min     | 0.2   | 0.81 | 0.1   | 6.7  | 7.9   | 11    | 50     | 1  | 12 | 15 |
| Average | 12.99 | 8.07 | 23.84 | 8.24 | 88.45 | 27.80 | 107.43 | 19 | 47 | 35 |
| Max     | 26    | 14   | 63    | 9.3  | 176   | 53.6  | 200    | 73 | 58 | 47 |
| Number  | 14    | 14   | 14    | 14   | 14    | 14    | 14     | 14 | 14 | 14 |

Depth to Coal: 40'

Statistical Summary Above Coal

|         |       |      |       |      |        |       |       |    |    |    |
|---------|-------|------|-------|------|--------|-------|-------|----|----|----|
| Min     | 0.6   | 0.81 | 0.4   | 6.7  | 7.9    | 11    | 50    | 1  | 12 | 15 |
| Average | 16.44 | 9.55 | 30.25 | 8.09 | 105.24 | 22.10 | 96.73 | 19 | 45 | 36 |
| Max     | 26    | 14   | 63    | 8.5  | 176    | 28.5  | 160   | 73 | 58 | 47 |
| Number  | 11    | 11   | 11    | 11   | 11     | 11    | 11    | 11 | 11 | 11 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.65

OVERBURDEN ANALYSIS DATA FOR SHOB-112R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2522.7                         | 2.5                          | 2520.2                            | 9.2             | 1.4           | 5.2               | 6.9       | 1.4            | 0.5  | 62                        | 7                | 47               | 46               | Silty Clay      |
| 2.5                       | 2520.2                         | 5                            | 2517.7                            | 28.7            | 3.2           | 16.8              | 7.5       | 3.6            | 0.76 | 73                        | 1                | 50               | 50               | Silty Clay      |
| 5                         | 2517.7                         | 7.5                          | 2515.2                            | 22.7            | 5.2           | 40.9              | 7.7       | 20             | 3.54 | 110                       | 1                | 48               | 52               | Silty Clay      |
| 7.5                       | 2515.2                         | 10                           | 2512.7                            | 23.1            | 8.7           | 80.2              | 5.1       | 55.8           | 7.76 | 78                        | 9                | 42               | 49               | Silty Clay      |
| 10                        | 2512.7                         | 12.5                         | 2510.2                            | 20.7            | 6.4           | 43.8              | 5.2       | 35.1           | 6.18 | 79                        | 1                | 62               | 38               | Silty Clay Loam |
| 12.5                      | 2510.2                         | 15                           | 2507.7                            | 24              | 5.9           | 42.1              | 7         | 31             | 5.4  | 110                       | 1                | 41               | 59               | Silty Clay      |
| 15                        | 2507.7                         | 17.5                         | 2505.2                            | 17.8            | 5.7           | 37.5              | 7.2       | 33.6           | 6.39 | 66                        | 1                | 66               | 34               | Silty Clay Loam |
| 17.5                      | 2505.2                         | 20                           | 2502.7                            | 17.1            | 6.2           | 42.4              | 7.2       | 36.5           | 6.69 | 57                        | 3                | 73               | 24               | Silt Loam       |
| 20                        | 2502.7                         | 25                           | 2497.7                            | 24              | 6.7           | 46.5              | 7.6       | 37.7           | 6.35 | 49                        | 13               | 67               | 20               | Silt Loam       |
| 25                        | 2497.7                         | 30                           | 2492.7                            | 22.7            | 6.6           | 41.2              | 7.7       | 37.6           | 6.64 | 39                        | 33               | 55               | 12               | Silt Loam       |
| 30                        | 2492.7                         | 35                           | 2487.7                            | 22.9            | 4.8           | 27                | 7.6       | 23.4           | 4.68 | 31                        | 83               | 11               | 6                | Loamy Sand      |
| 35                        | 2487.7                         | 40                           | 2482.7                            | 21.9            | 5             | 24.3              | 7.5       | 26.7           | 5.56 | 31                        | 85               | 10               | 5                | Loamy Sand      |
| 40                        | 2482.7                         | 45                           | 2477.7                            | 11.3            | 3.6           | 13.2              | 7.8       | 21.2           | 6.06 | 33                        | 85               | 9                | 6                | Loamy Sand      |
| 45                        | 2477.7                         | 50                           | 2472.7                            | 3.8             | 2.5           | 5.2               | 8         | 18.4           | 8.67 | 34                        | 85               | 9                | 6                | Loamy Sand      |
| 50                        | 2472.7                         | 55                           | 2467.7                            | 5.4             | 2.2           | 6.8               | 7.9       | 13.4           | 5.41 | 34                        | 83               | 10               | 7                | Loamy Sand      |
| 55                        | 2467.7                         | 60                           | 2462.7                            | 5.8             | 1.6           | 6.6               | 7.8       | 7.1            | 2.87 | 33                        | 79               | 13               | 8                | Loamy Sand      |
| 60                        | 2462.7                         | 65                           | 2457.7                            | 9.5             | 1.9           | 8.1               | 7.7       | 6              | 2.02 | 33                        |                  |                  |                  |                 |
| 65                        | 2457.7                         | 70                           | 2452.7                            | 4.2             | 1             | 3.3               | 7.7       | 3.5            | 1.8  | 32                        | 85               | 9                | 6                | Loamy Sand      |
| 70                        | 2452.7                         | 75                           | 2447.7                            | 4.5             | 1             | 3.5               | 7.7       | 3.3            | 1.65 | 35                        | 83               | 11               | 6                | Loamy Sand      |
| 75                        | 2447.7                         | 80                           | 2442.7                            | 6.2             | 1.2           | 4.8               | 7.7       | 3.6            | 1.55 | 34                        | 84               | 11               | 5                | Loamy Sand      |
| 80                        | 2442.7                         | 85                           | 2437.7                            | 24.2            | 3.2           | 17.2              | 7.6       | 5.3            | 1.15 | 30                        | 80               | 13               | 7                | Loamy Sand      |
| 85                        | 2437.7                         | 90                           | 2432.7                            | 14.6            | 2.4           | 11.8              | 7.3       | 5.6            | 1.54 | 31                        | 85               | 10               | 5                | Loamy Sand      |
| 110                       | 2412.7                         | 115                          | 2407.7                            | 0.6             | 1.6           | 0.6               | 8.4       | 15             | 19.6 | 130                       | 1                | 59               | 40               | Silty Clay      |
| 115                       | 2407.7                         | 120                          | 2402.7                            | 0.4             | 1.7           | 0.5               | 8.4       | 18.2           | 27.9 | 140                       | 1                | 46               | 53               | Silty Clay      |

Statistical Summary

|         |       |      |       |      |       |      |       |    |    |    |
|---------|-------|------|-------|------|-------|------|-------|----|----|----|
| Min     | 0.4   | 1    | 0.5   | 5.1  | 1.4   | 0.5  | 30    | 1  | 9  | 5  |
| Average | 14.39 | 3.74 | 22.06 | 7.43 | 19.29 | 5.86 | 57.67 | 43 | 34 | 24 |
| Max     | 28.7  | 8.7  | 80.2  | 8.4  | 55.8  | 27.9 | 140   | 85 | 73 | 59 |
| Number  | 24    | 24   | 24    | 24   | 24    | 24   | 24    | 23 | 23 | 23 |

Depth to Coal: 90'

Statistical Summary Above Coal

|         |       |      |       |      |       |      |       |    |    |    |
|---------|-------|------|-------|------|-------|------|-------|----|----|----|
| Min     | 3.8   | 1    | 3.3   | 5.1  | 1.4   | 0.5  | 30    | 1  | 9  | 5  |
| Average | 15.65 | 3.93 | 24.02 | 7.34 | 19.54 | 4.24 | 50.64 | 47 | 32 | 21 |
| Max     | 28.7  | 8.7  | 80.2  | 8    | 55.8  | 8.67 | 110   | 85 | 73 | 59 |
| Number  | 22    | 22   | 22    | 22   | 22    | 22   | 22    | 21 | 21 | 21 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.66

OVERBURDEN ANALYSIS DATA FOR SHOB-113R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2599.5                         | 2.5                          | 2597.0                            | 0.9             | 1.3           | 1                 | 8         | 12             | 12.2 | 59                        | 21               | 49               | 30               | Clay Loam       |
| 2.5                       | 2597.0                         | 5                            | 2594.5                            | 22.2            | 12            | 55.8              | 8.4       | 130            | 20.9 | 78                        | 23               | 45               | 32               | Clay Loam       |
| 5                         | 2594.5                         | 7.5                          | 2592.0                            | 23.1            | 15            | 94.3              | 8.3       | 178            | 23.2 | 100                       | 7                | 52               | 41               | Silty Clay      |
| 7.5                       | 2592.0                         | 10                           | 2589.5                            | 23.1            | 15            | 104               | 8.2       | 182            | 22.9 | 110                       | 1                | 47               | 53               | Silty Clay      |
| 10                        | 2589.5                         | 12.5                         | 2587.0                            | 26              | 12            | 48.7              | 6.9       | 126            | 20.6 | 88                        |                  |                  |                  |                 |
| 15                        | 2584.5                         | 17.5                         | 2582.0                            | 12.6            | 11            | 23.8              | 4.4       | 123            | 28.8 | 94                        |                  |                  |                  |                 |
| 17.5                      | 2582.0                         | 20                           | 2579.5                            | 9.4             | 6.4           | 13.4              | 6.1       | 61.2           | 18.1 | 120                       | 1                | 49               | 50               | Silty Clay      |
| 20                        | 2579.5                         | 25                           | 2574.5                            | 2               | 5.1           | 2.7               | 8.7       | 52.1           | 33.8 | 120                       | 3                | 67               | 30               | Silty Clay Loam |
| 25                        | 2574.5                         | 30                           | 2569.5                            | 1.4             | 3.7           | 1.7               | 8.7       | 36.1           | 28.8 | 92                        | 17               | 63               | 20               | Silt Loam       |
| 30                        | 2569.5                         | 35                           | 2564.5                            | 1.1             | 3.2           | 1.2               | 8.8       | 31.5           | 29.4 | 83                        | 37               | 43               | 20               | Loam            |
| 35                        | 2564.5                         | 40                           | 2559.5                            | 1.3             | 3.4           | 1.4               | 8.7       | 33.2           | 28.5 | 85                        | 21               | 59               | 20               | Silt Loam       |
| 40                        | 2559.5                         | 45                           | 2554.5                            | 3.9             | 6.2           | 4.5               | 7.4       | 65.5           | 31.8 | 89                        | 20               | 46               | 34               | Silty Clay Loam |
| 45                        | 2554.5                         | 50                           | 2549.5                            | 2.4             | 4.6           | 2.9               | 7.5       | 47.6           | 29.3 | 90                        | 11               | 51               | 38               | Silty Clay Loam |
| 50                        | 2549.5                         | 55                           | 2544.5                            | 0.9             | 3.1           | 1                 | 8.5       | 31.7           | 32   | 93                        | 1                | 64               | 36               | Silty Clay Loam |
| 55                        | 2544.5                         | 60                           | 2539.5                            | 1.1             | 3.6           | 1.2               | 8.5       | 35.6           | 33.5 | 63                        | 12               | 67               | 21               | Silt Loam       |
| 60                        | 2539.5                         | 65                           | 2534.5                            | 0.5             | 2.9           | 0.5               | 8.6       | 27.9           | 38.4 | 100                       | 2                | 71               | 27               | Silty Clay Loam |
| 65                        | 2534.5                         | 70                           | 2529.5                            | 0.5             | 2.5           | 0.4               | 8.8       | 24.5           | 36.6 | 120                       | 6                | 65               | 29               | Silty Clay Loam |
| 70                        | 2529.5                         | 75                           | 2524.5                            | 0.3             | 2.3           | 0.2               | 8.9       | 22.8           | 46   | 130                       | 12               | 60               | 28               | Silty Clay Loam |
| 75                        | 2524.5                         | 80                           | 2519.5                            | 0.4             | 2.9           | 0.5               | 8.9       | 30.9           | 47.2 | 110                       | 24               | 52               | 24               | Silt Loam       |
| 80                        | 2519.5                         | 85                           | 2514.5                            | 0.3             | 2.7           | 0.3               | 9.1       | 28.4           | 49.9 | 120                       | 6                | 66               | 28               | Silty Clay Loam |
| 85                        | 2514.5                         | 90                           | 2509.5                            | 0.3             | 2.5           | 0.3               | 9         | 27.3           | 51.1 | 120                       | 20               | 52               | 28               | Silty Clay Loam |
| 90                        | 2509.5                         | 95                           | 2504.5                            | 1.6             | 5.5           | 1.9               | 7.7       | 61.6           | 46.8 | 77                        | 46               | 35               | 19               | Loam            |
| 110                       | 2489.5                         | 115                          | 2484.5                            | 0.3             | 2.4           | 0.3               | 8.5       | 27             | 46.8 | 140                       | 7                | 63               | 30               | Silty Clay Loam |
| 115                       | 2484.5                         | 120                          | 2479.5                            | 0.2             | 1.8           | 0.2               | 9.2       | 18.9           | 47.3 | 140                       | 8                | 65               | 27               | Silty Clay Loam |

Statistical Summary

|         |      |      |       |      |       |       |        |    |    |    |
|---------|------|------|-------|------|-------|-------|--------|----|----|----|
| Min     | 0.2  | 1.3  | 0.2   | 4.4  | 12    | 12.2  | 59     | 1  | 35 | 19 |
| Average | 5.66 | 5.46 | 15.09 | 8.16 | 58.95 | 33.50 | 100.88 | 14 | 56 | 30 |
| Max     | 26   | 15   | 104   | 9.2  | 182   | 51.1  | 140    | 46 | 71 | 53 |
| Number  | 24   | 24   | 24    | 24   | 24    | 24    | 24     | 22 | 22 | 22 |

Depth to Coal: 95'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.3  | 1.3  | 0.2   | 4.4  | 12    | 12.2  | 59    | 1  | 35 | 19 |
| Average | 6.15 | 5.77 | 16.44 | 8.10 | 62.22 | 32.26 | 97.32 | 15 | 55 | 30 |
| Max     | 26   | 15   | 104   | 9.1  | 182   | 51.1  | 130   | 46 | 71 | 53 |
| Number  | 22   | 22   | 22    | 22   | 22    | 22    | 22    | 20 | 20 | 20 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-114R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2545.8                         | 5                            | 2540.8                            | 2               | 0.84          | 3                 | 7.6       | 4.6            | 2.9  | 77                        | 1                | 49               | 50               | Silty Clay      |
| 5                         | 2540.8                         | 7.5                          | 2538.3                            | 3.8             | 2.3           | 5.6               | 7.9       | 17.7           | 8.17 | 84                        | 1                | 48               | 51               | Silty Clay      |
| 7.5                       | 2538.3                         | 10                           | 2535.8                            | 24.2            | 6             | 27                | 7.9       | 43.6           | 8.62 | 78                        | 1                | 50               | 49               | Silty Clay      |
| 10                        | 2535.8                         | 12.5                         | 2533.3                            | 18.5            | 5.4           | 20.2              | 7.8       | 42             | 9.56 | 79                        | 3                | 50               | 47               | Silty Clay      |
| 12.5                      | 2533.3                         | 15                           | 2530.8                            | 26.3            | 5.8           | 25.2              | 7.9       | 39.2           | 7.73 | 81                        | 1                | 51               | 49               | Silty Clay      |
| 15                        | 2530.8                         | 17.5                         | 2528.3                            | 26.6            | 5.7           | 24                | 7.8       | 34.1           | 6.78 | 86                        | 1                | 45               | 55               | Silty Clay      |
| 17.5                      | 2528.3                         | 20                           | 2525.8                            | 11.6            | 4.3           | 12.7              | 7.9       | 28.8           | 8.27 | 91                        | 1                | 45               | 55               | Silty Clay      |
| 20                        | 2525.8                         | 25                           | 2520.8                            | 9.3             | 3.8           | 10                | 7.8       | 24.7           | 7.94 | 94                        | 1                | 41               | 59               | Silty Clay      |
| 25                        | 2520.8                         | 30                           | 2515.8                            | 28.3            | 5.4           | 23.6              | 7.6       | 25.6           | 5.03 | 30                        | 69               | 20               | 11               | Sandy Loam      |
| 30                        | 2515.8                         | 35                           | 2510.8                            | 23.4            | 4.8           | 20.4              | 7.6       | 23.4           | 5    | 30                        | 68               | 21               | 11               | Sandy Loam      |
| 35                        | 2510.8                         | 40                           | 2505.8                            | 26.1            | 4.4           | 24.9              | 7.6       | 14.8           | 2.94 | 32                        | 78               | 15               | 7                | Loamy Sand      |
| 40                        | 2505.8                         | 45                           | 2500.8                            | 12.8            | 3.9           | 16.7              | 7.7       | 21.8           | 5.67 | 31                        | 75               | 16               | 9                | Sandy Loam      |
| 60                        | 2485.8                         | 65                           | 2480.8                            | 1.2             | 1.9           | 1.6               | 7.9       | 19.2           | 16.3 | 130                       | 6                | 65               | 29               | Silty Clay Loam |
| 65                        | 2480.8                         | 70                           | 2475.8                            | 0.9             | 1.9           | 1.2               | 8.6       | 19.2           | 18.5 | 95                        | 9                | 70               | 21               | Silt Loam       |
| 70                        | 2475.8                         | 75                           | 2470.8                            | 1.9             | 3             | 2.3               | 8.6       | 30.5           | 20.9 | 49                        | 49               | 36               | 15               | Loam            |

Statistical Summary

|         |       |      |       |      |       |      |       |    |    |    |
|---------|-------|------|-------|------|-------|------|-------|----|----|----|
| Min     | 0.9   | 0.84 | 1.2   | 7.6  | 4.6   | 2.9  | 30    | 1  | 15 | 7  |
| Average | 14.46 | 3.96 | 14.56 | 7.88 | 25.95 | 8.95 | 71.13 | 24 | 41 | 35 |
| Max     | 28.3  | 6    | 27    | 8.6  | 43.6  | 20.9 | 130   | 78 | 70 | 59 |
| Number  | 15    | 15   | 15    | 15   | 15    | 15   | 15    | 15 | 15 | 15 |

Depth to Coal: 45'

Statistical Summary Above Coal

|         |       |      |       |      |       |      |       |    |    |    |
|---------|-------|------|-------|------|-------|------|-------|----|----|----|
| Min     | 2     | 0.84 | 3     | 7.6  | 4.6   | 2.9  | 30    | 1  | 15 | 7  |
| Average | 17.74 | 4.39 | 17.78 | 7.76 | 26.69 | 6.55 | 66.08 | 25 | 38 | 38 |
| Max     | 28.3  | 6    | 27    | 7.9  | 43.6  | 9.56 | 94    | 78 | 51 | 59 |
| Number  | 12    | 12   | 12    | 12   | 12    | 12   | 12    | 12 | 12 | 12 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.68

OVERBURDEN ANALYSIS DATA FOR SHOB-115R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2500.7                         | 2.5                          | 2498.2                            | 3               | 0.73          | 3.4               | 6.9       | 1              | 0.55 | 70                        | 9                | 46               | 45               | Silty Clay      |
| 2.5                       | 2498.2                         | 5                            | 2495.7                            | 0.8             | 0.7           | 1.1               | 8         | 5.7            | 5.89 | 86                        | 3                | 46               | 51               | Silty Clay      |
| 5                         | 2495.7                         | 7.5                          | 2493.2                            | 12.1            | 4.5           | 19                | 7.9       | 31.8           | 8.06 | 82                        | 3                | 48               | 49               | Silty Clay      |
| 7.5                       | 2493.2                         | 10                           | 2490.7                            | 7               | 4.5           | 11.8              | 8         | 40.3           | 13.2 | 71                        | 3                | 56               | 41               | Silty Clay      |
| 10                        | 2490.7                         | 12.5                         | 2488.2                            | 23.3            | 5.6           | 27.9              | 8.1       | 37.8           | 7.49 | 65                        | 5                | 52               | 43               | Silty Clay      |
| 12.5                      | 2488.2                         | 15                           | 2485.7                            | 25.8            | 5.4           | 25.9              | 7.8       | 32             | 6.29 | 81                        | 5                | 48               | 47               | Silty Clay      |
| 15                        | 2485.7                         | 17.5                         | 2483.2                            | 11.4            | 3.7           | 15.3              | 7.9       | 22.6           | 6.19 | 65                        | 10               | 52               | 38               | Silty Clay Loam |
| 17.5                      | 2483.2                         | 20                           | 2480.7                            | 8.4             | 2.9           | 10.1              | 7.8       | 18.6           | 6.11 | 38                        |                  |                  |                  |                 |
| 20                        | 2480.7                         | 25                           | 2475.7                            | 3.7             | 1.2           | 3.2               | 8         | 5.9            | 3.15 | 30                        | 85               | 9                | 6                | Loamy Sand      |
| 25                        | 2475.7                         | 30                           | 2470.7                            | 5.6             | 1.4           | 4.5               | 7.9       | 6.3            | 2.79 | 46                        | 42               | 33               | 25               | Loam            |
| 30                        | 2470.7                         | 35                           | 2465.7                            | 2.2             | 1.2           | 2.4               | 7.7       | 8.5            | 5.68 | 75                        | 15               | 60               | 25               | Silt Loam       |
| 35                        | 2465.7                         | 40                           | 2460.7                            | 1.4             | 1.5           | 1.7               | 7.8       | 13.3           | 10.7 | 94                        | 11               | 58               | 31               | Silty Clay Loam |
| 40                        | 2460.7                         | 45                           | 2455.7                            | 0.6             | 1.4           | 0.7               | 8.5       | 13.7           | 16.7 | 100                       | 9                | 63               | 28               | Silty Clay Loam |
| 45                        | 2455.7                         | 50                           | 2450.7                            | 0.4             | 1.2           | 0.4               | 8.5       | 12.6           | 19.8 | 120                       | 9                | 50               | 41               | Silty Clay      |
| 50                        | 2450.7                         | 55                           | 2445.7                            | 0.4             | 1.3           | 0.4               | 8.7       | 13.5           | 21.4 | 110                       | 15               | 49               | 36               | Silty Clay Loam |
| 55                        | 2445.7                         | 60                           | 2440.7                            | 0.8             | 1.8           | 1.2               | 8.4       | 17.6           | 17.7 | 81                        | 31               | 44               | 25               | Loam            |
| 75                        | 2425.7                         | 80                           | 2420.7                            | 1.9             | 3             | 2.4               | 6.9       | 31             | 21.4 | 80                        | 64               | 18               | 18               | Sandy Loam      |
| 80                        | 2420.7                         | 85                           | 2415.7                            | 0.2             | 1.3           | 0.2               | 8.7       | 13.8           | 31.3 | 120                       | 4                | 56               | 40               | Silty Clay      |
| 85                        | 2415.7                         | 90                           | 2410.7                            | 0.3             | 1.6           | 0.3               | 8.5       | 16.6           | 31.2 | 140                       | 2                | 44               | 54               | Silty Clay      |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 0.7  | 0.2  | 6.9  | 1     | 0.55  | 30    | 2  | 9  | 6  |
| Average | 5.75 | 2.36 | 6.94 | 8.00 | 18.03 | 12.40 | 81.79 | 18 | 46 | 36 |
| Max     | 25.8 | 5.6  | 27.9 | 8.7  | 40.3  | 31.3  | 140   | 85 | 63 | 54 |
| Number  | 19   | 19   | 19   | 19   | 19    | 19    | 19    | 18 | 18 | 18 |

Depth to Coal: 60'

Statistical Summary Above Coal

|         |      |      |      |      |       |      |       |    |    |    |
|---------|------|------|------|------|-------|------|-------|----|----|----|
| Min     | 0.4  | 0.7  | 0.4  | 6.9  | 1     | 0.55 | 30    | 3  | 9  | 6  |
| Average | 6.68 | 2.44 | 8.06 | 7.99 | 17.58 | 9.48 | 75.88 | 17 | 48 | 35 |
| Max     | 25.8 | 5.6  | 27.9 | 8.7  | 40.3  | 21.4 | 120   | 85 | 63 | 51 |
| Number  | 16   | 16   | 16   | 16   | 16    | 16   | 16    | 15 | 15 | 15 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.69

OVERBURDEN ANALYSIS DATA FOR SHOB-116R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture                      |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|------------------------------|
| 0                         | 2497.5                         | 2.5                          | 2495.0                            | 12              | 1.84          | 4                 | 7.5       | 4.7            | 1.7  | 55.1                      | 36               | 47               | 17               | Loam                         |
| 2.5                       | 2495.0                         | 5                            | 2492.5                            | 1.3             | 1.53          | 1.1               | 8.4       | 14             | 12.8 | 99.4                      | 13               | 47               | 40               | Silty Clay - Silty Clay Loam |
| 5                         | 2492.5                         | 7.5                          | 2490.0                            | 21              | 8.61          | 21                | 8.2       | 80             | 17.4 | 110                       | 20               | 48               | 32               | Silty Clay Loam              |
| 7.5                       | 2490.0                         | 10                           | 2487.5                            | 22              | 9.13          | 16                | 8.1       | 83             | 19   | 101                       | 19               | 47               | 34               | Silty Clay Loam              |
| 10                        | 2487.5                         | 12.5                         | 2485.0                            | 1.1             | 3.1           | 0.88              | 8.5       | 28             | 27.8 | 112                       | 25               | 47               | 28               | Clay Loam                    |
| 12.5                      | 2485.0                         | 15                           | 2482.5                            | 0.29            | 1.65          | 0.27              | 8.6       | 16             | 30   | 126                       | 34               | 36               | 30               | Clay Loam                    |
| 15                        | 2482.5                         | 17.5                         | 2480.0                            |                 |               |                   |           |                |      |                           | 57               | 25               | 18               | Silt loam                    |
| 17.5                      | 2480.0                         | 20                           | 2477.5                            |                 |               |                   |           |                |      |                           | 49               | 29               | 22               | Loam                         |
| 20                        | 2477.5                         | 25                           | 2472.5                            | 1.7             | 0.92          | 0.87              | 7.7       | 6.7            | 5.88 | 42.8                      | 53               | 26               | 21               | Sandy Clay Loam              |
| 25                        | 2472.5                         | 30                           | 2467.5                            | 2.8             | 1.02          | 1.4               | 7.6       | 6.5            | 4.47 | 98.8                      | 17               | 35               | 48               | Clay                         |
| 30                        | 2467.5                         | 35                           | 2462.5                            | 1.8             | 0.66          | 1.1               | 7.6       | 3.7            | 3.15 | 102                       | 13               | 37               | 50               | Clay                         |
| 35                        | 2462.5                         | 40                           | 2457.5                            | 2               | 0.68          | 1                 | 7.5       | 4              | 3.3  | 81.5                      | 37               | 25               | 38               | Clay Loam                    |
| 55                        | 2442.5                         | 60                           | 2437.5                            | 0.77            | 1             | 0.63              | 8.4       | 9.4            | 11.2 | 84.2                      | 48               | 30               | 22               | Loam                         |
| 60                        | 2437.5                         | 65                           | 2432.5                            | 1.1             | 0.91          | 0.45              | 7.3       | 7.9            | 8.88 | 47.7                      | 65               | 15               | 20               | Sandy Loam - Sandy Clay Loam |
| 65                        | 2432.5                         | 70                           | 2427.5                            | 0.4             | 0.76          | 0.26              | 7.8       | 7.3            | 12.8 | 94.8                      | 43               | 25               | 32               | Clay Loam                    |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.29 | 0.66 | 0.26 | 7.3  | 3.7   | 1.7   | 42.8  | 13 | 15 | 17 |
| Average | 5.25 | 2.45 | 3.77 | 7.94 | 20.86 | 12.18 | 88.87 | 35 | 35 | 30 |
| Max     | 22   | 9.13 | 21   | 8.6  | 83    | 30    | 126   | 65 | 48 | 50 |
| Number  | 13   | 13   | 13   | 13   | 13    | 13    | 13    | 15 | 15 | 15 |

Depth to Coal: 40'

Statistical Summary Above Coal

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.29 | 0.66 | 0.27 | 7.5  | 3.7   | 1.7   | 42.8  | 13 | 25 | 17 |
| Average | 6.60 | 2.91 | 4.76 | 7.97 | 24.66 | 12.55 | 92.86 | 31 | 37 | 32 |
| Max     | 22   | 9.13 | 21   | 8.6  | 83    | 30    | 126   | 57 | 48 | 50 |
| Number  | 10   | 10   | 10   | 10   | 10    | 10    | 10    | 12 | 12 | 12 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.70

OVERBURDEN ANALYSIS DATA FOR SHOB-117R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2507.9                         | 2.5                          | 2505.4                            | 4.4             | 0.69          | 1.9               | 7         | 0.8            | 0.42 | 28                        | 66               | 19               | 15               | Sandy Loam      |
| 2.5                       | 2505.4                         | 5                            | 2502.9                            | 3.3             | 0.73          | 3                 | 7.5       | 0.8            | 0.45 | 27                        | 62               | 21               | 17               | Sandy Loam      |
| 5                         | 2502.9                         | 7.5                          | 2500.4                            | 2               | 1.2           | 4.6               | 7.8       | 5.8            | 3.22 | 28                        | 62               | 23               | 15               | Sandy Loam      |
| 7.5                       | 2500.4                         | 10                           | 2497.9                            | 24.6            | 4.2           | 28                | 7.6       | 11.1           | 2.16 | 66                        | 8                | 57               | 35               | Silty Clay Loam |
| 10                        | 2497.9                         | 12.5                         | 2495.4                            | 26.7            | 4             | 23.5              | 7.6       | 9.6            | 1.92 | 42                        | 46               | 33               | 21               | Loam            |
| 12.5                      | 2495.4                         | 15                           | 2492.9                            | 18.2            | 3.1           | 16.1              | 7.4       | 7.7            | 1.86 | 75                        | 20               | 45               | 35               | Silty Clay Loam |
| 15                        | 2492.9                         | 17.5                         | 2490.4                            | 26.4            | 3.8           | 19.1              | 7.4       | 10             | 2.09 | 66                        | 15               | 50               | 35               | Silty Clay Loam |
| 17.5                      | 2490.4                         | 20                           | 2487.9                            | 24.8            | 4.9           | 28                | 7.5       | 20.7           | 4.03 | 57                        | 24               | 49               | 27               | Clay Loam       |
| 20                        | 2487.9                         | 25                           | 2482.9                            | 21.9            | 5.8           | 31.3              | 7.4       | 31.6           | 6.13 | 74                        | 21               | 41               | 38               | Clay Loam       |
| 25                        | 2482.9                         | 30                           | 2477.9                            | 21.3            | 6.4           | 32.3              | 7.6       | 40.2           | 7.77 | 57                        | 44               | 31               | 25               | Loam            |
| 30                        | 2477.9                         | 35                           | 2472.9                            | 21.8            | 6.2           | 31.9              | 7.8       | 37.5           | 7.23 | 69                        | 36               | 33               | 31               | Clay Loam       |
| 35                        | 2472.9                         | 40                           | 2467.9                            | 7               | 4.3           | 12.1              | 8.4       | 30.4           | 9.85 | 46                        | 62               | 20               | 18               | Sandy Loam      |
| 40                        | 2467.9                         | 45                           | 2462.9                            | 6.9             | 4.6           | 11                | 8.4       | 35.8           | 12   | 45                        | 64               | 19               | 17               | Sandy Loam      |
| 45                        | 2462.9                         | 50                           | 2457.9                            | 6.5             | 5             | 8.7               | 7         | 40.3           | 14.6 | 53                        | 74               | 16               | 10               | Sandy Loam      |
| 65                        | 2442.9                         | 70                           | 2437.9                            | 0.6             | 2.2           | 0.7               | 8         | 21             | 26.2 | 130                       | 10               | 33               | 57               | Clay            |
| 70                        | 2437.9                         | 75                           | 2432.9                            | 0.2             | 1.5           | 0.2               | 8.7       | 14.6           | 36.7 | 140                       | 2                | 47               | 51               | Silty Clay      |
| 75                        | 2432.9                         | 80                           | 2427.9                            | 0.2             | 1.5           | 0.2               | 8.9       | 15.6           | 39.2 | 130                       | 8                | 56               | 36               | Silty Clay Loam |

Statistical Summary

|         |       |      |       |      |       |       |       |    |    |    |
|---------|-------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2   | 0.69 | 0.2   | 7    | 0.8   | 0.42  | 27    | 2  | 16 | 10 |
| Average | 12.75 | 3.54 | 14.86 | 7.76 | 19.62 | 10.34 | 66.65 | 37 | 35 | 28 |
| Max     | 26.7  | 6.4  | 32.3  | 8.9  | 40.3  | 39.2  | 140   | 74 | 57 | 57 |
| Number  | 17    | 17   | 17    | 17   | 17    | 17    | 17    | 17 | 17 | 17 |

Depth to Coal: 50'

Statistical Summary Above Coal

|         |       |      |       |      |       |      |       |    |    |    |
|---------|-------|------|-------|------|-------|------|-------|----|----|----|
| Min     | 2     | 0.69 | 1.9   | 7    | 0.8   | 0.42 | 27    | 8  | 16 | 10 |
| Average | 15.41 | 3.92 | 17.96 | 7.60 | 20.16 | 5.27 | 52.36 | 43 | 33 | 24 |
| Max     | 26.7  | 6.4  | 32.3  | 8.4  | 40.3  | 14.6 | 75    | 74 | 57 | 38 |
| Number  | 14    | 14   | 14    | 14   | 14    | 14   | 14    | 14 | 14 | 14 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.71

OVERBURDEN ANALYSIS DATA FOR SHOB-118R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2490.4                         | 2.5                          | 2487.9                            | 16.6            | 6.8           | 24.7              | 7.6       | 54.3           | 12   | 58                        |                  |                  |                  |                 |
| 2.5                       | 2487.9                         | 5                            | 2485.4                            | 25.7            | 13            | 76.6              | 8.2       | 161            | 22.5 | 81                        | 10               | 46               | 44               | Silty Clay      |
| 5                         | 2485.4                         | 7.5                          | 2482.9                            | 24.1            | 11            | 47                | 8.2       | 130            | 21.9 | 86                        | 10               | 43               | 47               | Silty Clay      |
| 7.5                       | 2482.9                         | 10                           | 2480.4                            | 23.4            | 7.8           | 27.4              | 8         | 77.4           | 15.4 | 68                        | 10               | 48               | 42               | Silty Clay      |
| 10                        | 2480.4                         | 12.5                         | 2477.9                            | 22              | 6.2           | 18.8              | 8         | 53.5           | 11.9 | 72                        | 22               | 38               | 40               | Clay            |
| 12.5                      | 2477.9                         | 15                           | 2475.4                            | 1.2             | 2             | 1.2               | 8.3       | 19.4           | 17.6 | 150                       | 2                | 58               | 40               | Silty Clay      |
| 15                        | 2475.4                         | 17.5                         | 2472.9                            | 0.4             | 1.4           | 0.4               | 8.5       | 14.3           | 22.6 | 170                       | 6                | 60               | 34               | Silty Clay Loam |
| 17.5                      | 2472.9                         | 20                           | 2470.4                            | 0.7             | 1.7           | 0.7               | 8.3       | 16.4           | 19.6 | 150                       | 1                | 62               | 37               | Silty Clay Loam |
| 20                        | 2470.4                         | 25                           | 2465.4                            | 1               | 2.2           | 1                 | 8.4       | 22.1           | 22.1 | 140                       | 18               | 50               | 32               | Silty Clay Loam |
| 25                        | 2465.4                         | 30                           | 2460.4                            | 0.6             | 1.8           | 0.5               | 8.8       | 19.3           | 25.3 | 95                        | 24               | 51               | 25               | Silt Loam       |
| 30                        | 2460.4                         | 35                           | 2455.4                            | 0.1             | 1.1           | 0.1               | 8.6       | 12.1           | 36.5 | 160                       | 4                | 49               | 47               | Silty Clay      |
| 35                        | 2455.4                         | 40                           | 2450.4                            | 0.2             | 1.6           | 0.2               | 8.7       | 18.2           | 41.5 | 110                       | 30               | 43               | 27               | Clay Loam       |
| 40                        | 2450.4                         | 45                           | 2445.4                            | 0.1             | 1.5           | 0.1               | 9         | 15.5           | 42.3 | 94                        | 52               | 22               | 26               | Sandy Clay Loam |
| 45                        | 2445.4                         | 50                           | 2440.4                            | 0.5             | 2.4           | 0.5               | 8         | 26.5           | 37.4 | 71                        | 54               | 24               | 22               | Sandy Clay Loam |
| 70                        | 2420.4                         | 75                           | 2415.4                            | 0.3             | 1.9           | 0.3               | 7.7       | 21.9           | 41.4 | 140                       | 12               | 27               | 61               | Clay            |
| 75                        | 2415.4                         | 80                           | 2410.4                            | 0.1             | 1.3           | 0.09              | 8.8       | 14.6           | 44.4 | 150                       | 1                | 50               | 50               | Silty Clay      |
| 80                        | 2410.4                         | 85                           | 2405.4                            | 0.1             | 1.5           | 0.1               | 9         | 16.3           | 50.1 | 120                       | 28               | 45               | 27               | Clay Loam       |

Statistical Summary

|         |      |      |       |      |       |       |        |    |    |    |
|---------|------|------|-------|------|-------|-------|--------|----|----|----|
| Min     | 0.1  | 1.1  | 0.09  | 7.6  | 12.1  | 11.9  | 58     | 1  | 22 | 22 |
| Average | 6.89 | 3.84 | 11.75 | 8.36 | 40.75 | 28.50 | 112.65 | 18 | 45 | 38 |
| Max     | 25.7 | 13   | 76.6  | 9    | 161   | 50.1  | 170    | 54 | 62 | 61 |
| Number  | 17   | 17   | 17    | 17   | 17    | 17    | 17     | 16 | 16 | 16 |

Depth to Coal: 50'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |        |    |    |    |
|---------|------|------|-------|------|-------|-------|--------|----|----|----|
| Min     | 0.1  | 1.1  | 0.1   | 7.6  | 12.1  | 11.9  | 58     | 1  | 22 | 22 |
| Average | 8.33 | 4.32 | 14.23 | 8.33 | 45.71 | 24.90 | 107.50 | 19 | 46 | 36 |
| Max     | 25.7 | 13   | 76.6  | 9    | 161   | 42.3  | 170    | 54 | 62 | 47 |
| Number  | 14   | 14   | 14    | 14   | 14    | 14    | 14     | 13 | 13 | 13 |

NOTES:

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- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.72

OVERBURDEN ANALYSIS DATA FOR SHOB-119R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2604.4                         | 2.5                          | 2601.9                            | 23              | 6.7           | 22.5              | 8.1       | 57.9           | 12.1 | 150                       | 1                | 38               | 62               | Clay            |
| 2.5                       | 2601.9                         | 5                            | 2599.4                            | 13.3            | 12            | 43.5              | 8.3       | 142            | 26.7 | 130                       | 1                | 57               | 43               | Silty Clay      |
| 5                         | 2599.4                         | 7.5                          | 2596.9                            | 22.5            | 12            | 50.8              | 8         | 120            | 19.8 | 120                       | 4                | 48               | 48               | Silty Clay      |
| 7.5                       | 2596.9                         | 10                           | 2594.4                            | 23.2            | 12            | 54.9              | 7.8       | 117            | 18.8 | 110                       | 1                | 50               | 50               | Silty Clay      |
| 10                        | 2594.4                         | 12.5                         | 2591.9                            | 20.7            | 18            | 173               | 5.5       | 177            | 18   | 140                       | 82               | 8                | 10               | Loamy Sand      |
| 15                        | 2589.4                         | 17.5                         | 2586.9                            | 21.8            | 14            | 60.7              | 5.2       | 147            | 22.8 | 95                        | 14               | 42               | 44               | Silty Clay      |
| 17.5                      | 2586.9                         | 20                           | 2584.4                            | 0.7             | 3.7           | 0.8               | 8.7       | 36.6           | 41.9 | 170                       | 4                | 48               | 48               | Silty Clay      |
| 20                        | 2584.4                         | 25                           | 2579.4                            | 0.6             | 3.8           | 0.8               | 8.7       | 36.8           | 43.2 | 160                       | 6                | 50               | 44               | Silty Clay      |
| 25                        | 2579.4                         | 30                           | 2574.4                            | 0.6             | 3.4           | 1.1               | 8.9       | 33             | 36.6 | 150                       | 6                | 64               | 30               | Silty Clay Loam |
| 30                        | 2574.4                         | 35                           | 2569.4                            | 3.3             | 5.4           | 8.4               | 8.3       | 48.5           | 20   | 110                       | 10               | 68               | 22               | Silt Loam       |
| 35                        | 2569.4                         | 40                           | 2564.4                            | 25.2            | 17            | 131               | 5.6       | 163            | 18.5 | 70                        | 28               | 50               | 22               | Silt Loam       |
| 40                        | 2564.4                         | 45                           | 2559.4                            | 21.8            | 8.5           | 39.3              | 6.7       | 64.3           | 11.6 | 36                        |                  |                  |                  |                 |
| 45                        | 2559.4                         | 50                           | 2554.4                            | 22.5            | 7             | 24.7              | 7.7       | 49.3           | 10.2 |                           |                  |                  |                  |                 |
| 50                        | 2554.4                         | 55                           | 2549.4                            | 23.9            | 7.1           | 20.9              | 7.8       | 55.1           | 11.6 | 32                        | 68               | 22               | 10               | Sandy Loam      |
| 55                        | 2549.4                         | 60                           | 2544.4                            | 23.7            | 7             | 18.7              | 7.8       | 55.1           | 12   | 32                        | 74               | 17               | 9                | Sandy Loam      |
| 60                        | 2544.4                         | 65                           | 2539.4                            | 22.5            | 7.1           | 19.8              | 7.7       | 55.8           | 12.1 | 30                        | 82               | 9                | 9                | Loamy Sand      |
| 65                        | 2539.4                         | 70                           | 2534.4                            | 2               | 3.4           | 2.5               | 8.3       | 29.4           | 19.6 | 30                        | 84               | 9                | 7                | Loamy Sand      |
| 70                        | 2534.4                         | 75                           | 2529.4                            | 3.1             | 4.2           | 3.7               | 8.2       | 37.7           | 20.4 | 30                        | 80               | 13               | 7                | Loamy Sand      |
| 75                        | 2529.4                         | 80                           | 2524.4                            | 0.4             | 2.6           | 0.4               | 9         | 26.7           | 43.1 | 110                       | 23               | 51               | 26               | Silt Loam       |
| 80                        | 2524.4                         | 85                           | 2519.4                            | 0.3             | 2.7           | 0.4               | 9.3       | 27             | 44.6 | 110                       | 44               | 31               | 25               | Loam            |
| 85                        | 2519.4                         | 90                           | 2514.4                            | 0.2             | 2.3           | 0.2               | 9.4       | 22.3           | 46.4 | 120                       | 58               | 19               | 23               | Sandy Clay Loam |
| 90                        | 2514.4                         | 95                           | 2509.4                            | 0.2             | 2.2           | 0.2               | 9.5       | 24.8           | 59.4 | 120                       | 58               | 17               | 25               | Sandy Clay Loam |
| 95                        | 2509.4                         | 100                          | 2504.4                            | 0.3             | 2.6           | 0.3               | 9.4       | 29.2           | 55.4 | 86                        | 67               | 14               | 19               | Sandy Loam      |
| 100                       | 2504.4                         | 105                          | 2499.4                            | 0.7             | 3.7           | 0.8               | 8.4       | 45             | 52.4 | 82                        | 63               | 16               | 21               | Sandy Clay Loam |
| 105                       | 2499.4                         | 110                          | 2494.4                            | 1               | 5             | 1.1               | 7.7       | 62.4           | 60.6 | 84                        | 70               | 15               | 15               | Sandy Loam      |
| 120                       | 2484.4                         | 125                          | 2479.4                            | 1.1             | 3.3           | 1.1               | 7.4       | 38             | 35.9 | 110                       | 40               | 39               | 21               | Loam            |
| 125                       | 2479.4                         | 130                          | 2474.4                            | 0.7             | 2.9           | 0.8               | 8.3       | 31.6           | 36.4 | 57                        |                  |                  |                  |                 |
| 130                       | 2474.4                         | 135                          | 2469.4                            | 0.6             | 2.9           | 0.8               | 8.2       | 34.2           | 39.8 | 63                        | 50               | 35               | 15               | Loam            |

Statistical Summary

|         |       |      |       |      |       |       |       |    |    |    |
|---------|-------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2   | 2.2  | 0.2   | 5.2  | 22.3  | 10.2  | 30    | 1  | 8  | 7  |
| Average | 10.00 | 6.52 | 24.40 | 8.00 | 63.10 | 30.35 | 93.96 | 41 | 33 | 26 |
| Max     | 25.2  | 18   | 173   | 9.5  | 177   | 60.6  | 170   | 84 | 68 | 62 |
| Number  | 28    | 28   | 28    | 28   | 28    | 28    | 27    | 25 | 25 | 25 |

Depth to Coal: 110'

Statistical Summary Above Coal

|         |       |      |       |      |       |       |       |    |    |    |
|---------|-------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2   | 2.2  | 0.2   | 5.2  | 22.3  | 10.2  | 30    | 1  | 8  | 7  |
| Average | 11.10 | 6.94 | 27.22 | 8.00 | 66.52 | 29.51 | 96.13 | 40 | 33 | 27 |
| Max     | 25.2  | 18   | 173   | 9.5  | 177   | 60.6  | 170   | 84 | 68 | 62 |
| Number  | 25    | 25   | 25    | 25   | 25    | 25    | 24    | 23 | 23 | 23 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.73

OVERBURDEN ANALYSIS DATA FOR SHOB-120R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2531.2                         | 2.5                          | 2528.7                            |                 |               |                   |           |                |      |                           | 44               | 26               | 30               | Clay Loam       |
| 2.5                       | 2528.7                         | 5                            | 2526.2                            | 1.4             | 0.43          | 2.2               | 8         | 1.4            | 1.03 | 47.7                      | 56               | 22               | 22               | Sandy Clay Loam |
| 5                         | 2526.2                         | 7.5                          | 2523.7                            | 0.37            | 0.37          | 2.6               | 8.4       | 1.3            | 1.04 | 47.4                      | 75               | 17               | 8                | Sandy Loam      |
| 7.5                       | 2523.7                         | 10                           | 2521.2                            | 0.54            | 0.53          | 2.6               | 8.3       | 1.5            | 1.24 | 52.1                      | 79               | 17               | 4                | Loamy Sand      |
| 10                        | 2521.2                         | 12.5                         | 2518.7                            | 1.6             | 0.73          | 4.5               | 8.4       | 2              | 1.16 | 49                        | 78               | 19               | 3                | Loamy Sand      |
| 12.5                      | 2518.7                         | 15                           | 2516.2                            | 0.76            | 0.33          | 1.1               | 8.6       | 1.2            | 1.27 | 47.6                      | 75               | 20               | 5                | Sandy Loam      |
| 15                        | 2516.2                         | 17.5                         | 2513.7                            | 0.68            | 0.25          | 0.71              | 7.1       | 1.1            | 1.36 | 50.1                      | 83               | 13               | 4                | Loamy Sand      |
| 17.5                      | 2513.7                         | 20                           | 2511.2                            | 0.85            | 0.28          | 0.67              | 8.3       | 1.4            | 1.66 | 42.8                      | 79               | 16               | 5                | Loamy Sand      |
| 20                        | 2511.2                         | 25                           | 2506.2                            | 0.68            | 0.27          | 0.49              | 8.4       | 1.5            | 1.94 | 43                        | 82               | 15               | 3                | Loamy Sand      |
| 25                        | 2506.2                         | 30                           | 2501.2                            | 0.62            | 0.28          | 0.51              | 8.3       | 1.7            | 2.27 | 42.1                      | 83               | 11               | 6                | Loamy Sand      |
| 30                        | 2501.2                         | 35                           | 2496.2                            | 0.65            | 0.73          | 0.56              | 8         | 6.4            | 8.3  | 51.4                      | 75               | 15               | 10               | Sandy Loam      |
| 35                        | 2496.2                         | 40                           | 2491.2                            | 0.83            | 1.17          | 0.91              | 8.2       | 10             | 11   | 80.6                      | 55               | 29               | 16               | Sandy Loam      |
| 40                        | 2491.2                         | 45                           | 2486.2                            | 1.4             | 1.66          | 1.3               | 8.5       | 14             | 12.1 | 110                       | 21               | 47               | 32               | Clay Loam       |
| 45                        | 2486.2                         | 50                           | 2481.2                            | 0.62            | 1.38          | 0.67              | 8.7       | 12             | 15.1 | 107                       | 45               | 30               | 25               | Loam            |
| 50                        | 2481.2                         | 55                           | 2476.2                            | 0.95            | 1.63          | 1.1               | 8.9       | 14             | 14   | 94.1                      | 49               | 32               | 19               | Loam            |
| 55                        | 2476.2                         | 60                           | 2471.2                            | 0.58            | 1.29          | 0.63              | 9.2       | 12             | 14.9 | 124                       | 62               | 22               | 16               | Sandy Loam      |
| 60                        | 2471.2                         | 65                           | 2466.2                            | 1.4             | 1.62          | 1.5               | 7.6       | 14             | 12   | 54.4                      | 73               | 15               | 12               | Sandy Loam      |
| 80                        | 2451.2                         | 85                           | 2446.2                            | 1.9             | 2.31          | 2                 | 7         | 21             | 14.7 | 76.3                      | 55               | 24               | 21               | Sandy Clay Loam |
| 85                        | 2446.2                         | 90                           | 2441.2                            | 0.46            | 1.09          | 0.39              | 8.9       | 10             | 15.4 | 125                       | 7                | 55               | 38               | Silty Clay Loam |
| 90                        | 2441.2                         | 95                           | 2436.2                            | 0.4             | 1.1           | 0.34              | 9         | 11             | 17.7 | 127                       | 6                | 55               | 39               | Silty Clay Loam |
| 95                        | 2436.2                         | 100                          | 2431.2                            | 0.27            | 1.22          | 0.23              | 8.9       | 13             | 25.1 | 151                       | 1                | 49               | 50               | Silty Clay      |

Statistical Summary

|         |      |      |      |      |      |      |       |    |    |    |
|---------|------|------|------|------|------|------|-------|----|----|----|
| Min     | 0.27 | 0.25 | 0.23 | 7    | 1.1  | 1.03 | 42.1  | 1  | 11 | 3  |
| Average | 0.85 | 0.93 | 1.25 | 8.34 | 7.53 | 8.66 | 76.13 | 56 | 26 | 18 |
| Max     | 1.9  | 2.31 | 4.5  | 9.2  | 21   | 25.1 | 151   | 83 | 55 | 50 |
| Number  | 20   | 20   | 20   | 20   | 20   | 20   | 20    | 21 | 21 | 21 |

Depth to Coal: 65'

Statistical Summary Above Coal

|         |      |      |      |      |      |      |       |    |    |    |
|---------|------|------|------|------|------|------|-------|----|----|----|
| Min     | 0.37 | 0.25 | 0.49 | 7.1  | 1.1  | 1.03 | 42.1  | 21 | 11 | 3  |
| Average | 0.87 | 0.81 | 1.38 | 8.31 | 5.97 | 6.27 | 65.21 | 66 | 22 | 13 |
| Max     | 1.6  | 1.66 | 4.5  | 9.2  | 14   | 15.1 | 124   | 83 | 47 | 32 |
| Number  | 16   | 16   | 16   | 16   | 16   | 16   | 16    | 17 | 17 | 17 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.74

OVERBURDEN ANALYSIS DATA FOR SHOB-121R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2515.1                         | 2.5                          | 2512.6                            | 1.6             | 0.46          | 1.1               | 7.3       | 1.4            | 1.19 | 57.1                      | 55               | 27               | 18               | Sandy Loam      |
| 2.5                       | 2512.6                         | 5                            | 2510.1                            | 1.6             | 0.44          | 2                 | 7.7       | 1.2            | 0.89 | 46.6                      | 63               | 21               | 16               | Sandy Loam      |
| 5                         | 2510.1                         | 7.5                          | 2507.6                            | 0.6             | 0.71          | 1.9               | 8.1       | 4.5            | 4.04 | 16.3                      | 79               | 11               | 10               | Sandy Loam      |
| 7.5                       | 2507.6                         | 10                           | 2505.1                            | 4.2             | 3.92          | 12                | 8.2       | 29             | 10.3 | 49.7                      | 48               | 38               | 14               | Loam            |
| 10                        | 2505.1                         | 12.5                         | 2502.6                            | 23              | 6.44          | 31                | 7.9       | 36             | 6.95 | 67.1                      | 24               | 52               | 24               | Silt Loam       |
| 12.5                      | 2502.6                         | 15                           | 2500.1                            | 23              | 6.15          | 26                | 7.8       | 35             | 7.08 | 80                        | 31               | 41               | 28               | Clay Loam       |
| 15                        | 2500.1                         | 17.5                         | 2497.6                            | 24              | 6.78          | 26                | 7.7       | 45             | 9.09 | 87.4                      | 40               | 26               | 34               | Clay Loam       |
| 20                        | 2495.1                         | 25                           | 2490.1                            | 6               | 3.81          | 8.8               | 8         | 29             | 10.8 | 128                       | 33               | 34               | 33               | Clay Loam       |
| 25                        | 2490.1                         | 30                           | 2485.1                            | 9               | 4.33          | 10                | 8         | 34             | 11   | 106                       | 40               | 30               | 30               | Clay Loam       |
| 30                        | 2485.1                         | 35                           | 2480.1                            | 4.2             | 3.3           | 5.7               | 8.1       | 28             | 12.8 | 102                       | 48               | 27               | 25               | Sandy Clay Loam |
| 35                        | 2480.1                         | 40                           | 2475.1                            | 3.5             | 3.37          | 4.9               | 8.7       | 30             | 14.9 | 90                        | 58               | 24               | 18               | Sandy Loam      |
| 40                        | 2475.1                         | 45                           | 2470.1                            | 3.2             | 3.08          | 4.2               | 8.7       | 27             | 14.1 | 111                       | 40               | 36               | 24               | Loam            |
| 45                        | 2470.1                         | 50                           | 2465.1                            | 4.1             | 3.09          | 5                 | 8.6       | 27             | 12.7 | 88.6                      | 57               | 26               | 17               | Sandy Loam      |
| 70                        | 2445.1                         | 75                           | 2440.1                            | 2.3             | 1.77          | 2.1               | 7.7       | 15             | 10.1 | 109                       | 29               | 37               | 34               | Clay Loam       |
| 75                        | 2440.1                         | 80                           | 2435.1                            | 0.3             | 1.16          | 0.36              | 8.7       | 11             | 18.6 | 96.7                      | 28               | 28               | 44               | Clay            |

Statistical Summary

|         |      |      |      |      |       |      |       |    |    |    |
|---------|------|------|------|------|-------|------|-------|----|----|----|
| Min     | 0.3  | 0.44 | 0.36 | 7.3  | 1.2   | 0.89 | 16.3  | 24 | 11 | 10 |
| Average | 7.37 | 3.25 | 9.40 | 8.08 | 23.54 | 9.64 | 82.37 | 45 | 31 | 25 |
| Max     | 24   | 6.78 | 31   | 8.7  | 45    | 18.6 | 128   | 79 | 52 | 44 |
| Number  | 15   | 15   | 15   | 15   | 15    | 15   | 15    | 15 | 15 | 15 |

Depth to Coal: 50'

Statistical Summary Above Coal

|         |      |      |       |      |       |      |       |    |    |    |
|---------|------|------|-------|------|-------|------|-------|----|----|----|
| Min     | 0.6  | 0.44 | 1.1   | 7.3  | 1.2   | 0.89 | 16.3  | 24 | 11 | 10 |
| Average | 8.31 | 3.53 | 10.66 | 8.06 | 25.16 | 8.91 | 79.22 | 47 | 30 | 22 |
| Max     | 24   | 6.78 | 31    | 8.7  | 45    | 14.9 | 128   | 79 | 52 | 34 |
| Number  | 13   | 13   | 13    | 13   | 13    | 13   | 13    | 13 | 13 | 13 |

NOTES:

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- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.75

OVERBURDEN ANALYSIS DATA FOR SHOB-122R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture                    |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|----------------------------|
| 0                         | 2498.7                         | 2.5                          | 2496.2                            |                 |               |                   |           |                |      |                           | 50               | 30               | 20               | Loam                       |
| 2.5                       | 2496.2                         | 5                            | 2493.7                            | 9               | 0.74          | 7.5               | 8.1       | 21             | 7.34 | 94                        | 11               | 56               | 33               | Silty Clay Loam            |
| 5                         | 2493.7                         | 7.5                          | 2491.2                            | 3.1             | 2.88          | 2.2               | 8.2       | 24             | 15   | 78.6                      | 24               | 49               | 27               | Clay Loam - Loam           |
| 7.5                       | 2491.2                         | 10                           | 2488.7                            | 21              | 8.06          | 11                | 8.2       | 71             | 18   | 103                       | 4                | 62               | 34               | Silty Clay Loam            |
| 10                        | 2488.7                         | 12.5                         | 2486.2                            | 3.2             | 3.43          | 1.9               | 8.2       | 29             | 18   | 71.5                      | 47               | 31               | 22               | Loam                       |
| 12.5                      | 2486.2                         | 15                           | 2483.7                            | 0.77            | 1.64          | 0.68              | 8.5       | 13             | 15.2 | 96.3                      | 23               | 51               | 26               | Silt Loam                  |
| 15                        | 2483.7                         | 17.5                         | 2481.2                            | 1.2             | 1.2           | 1.1               | 8.3       | 9.2            | 8.63 | 85.7                      | 23               | 47               | 30               | Clay Loam                  |
| 17.5                      | 2481.2                         | 20                           | 2478.7                            | 24              | 3.53          | 12                | 7.6       | 12             | 2.85 | 148                       | 51               | 24               | 25               | Sandy Clay Loam            |
| 20                        | 2478.7                         | 25                           | 2473.7                            |                 |               |                   |           |                |      |                           | 17               | 43               | 40               | Silty Clay-Silty Clay Loam |
| 25                        | 2473.7                         | 30                           | 2468.7                            | 1.8             | 0.72          | 0.73              | 7.7       | 5.2            | 4.63 | 41.4                      | 13               | 73               | 14               | Silt Loam                  |
| 50                        | 2448.7                         | 55                           | 2443.7                            |                 |               |                   |           |                |      |                           | 25               | 48               | 27               | Clay Loam-Loam             |
| 55                        | 2443.7                         | 60                           | 2438.7                            | 0.17            | 0.89          | 0.13              | 8.8       | 9              | 23.4 | 122                       | 29               | 37               | 34               | Clay Loam                  |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.17 | 0.72 | 0.13 | 7.6  | 5.2   | 2.85  | 41.4  | 4  | 24 | 14 |
| Average | 7.14 | 2.57 | 4.14 | 8.18 | 21.49 | 12.56 | 93.39 | 26 | 46 | 28 |
| Max     | 24   | 8.06 | 12   | 8.8  | 71    | 23.4  | 148   | 51 | 73 | 40 |
| Number  | 9    | 9    | 9    | 9    | 9     | 9     | 9     | 12 | 12 | 12 |

Depth to Coal: 30'

Statistical Summary Above Coal

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.77 | 0.72 | 0.68 | 7.6  | 5.2   | 2.85  | 41.4  | 4  | 24 | 14 |
| Average | 8.01 | 2.78 | 4.64 | 8.10 | 23.05 | 11.21 | 89.81 | 26 | 47 | 27 |
| Max     | 24   | 8.06 | 12   | 8.5  | 71    | 18    | 148   | 51 | 73 | 40 |
| Number  | 8    | 8    | 8    | 8    | 8     | 8     | 8     | 10 | 10 | 10 |

NOTES:

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- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.76

OVERBURDEN ANALYSIS DATA FOR SHOB-123R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2507.4                         | 2.5                          | 2504.9                            | 2.9             | 0.76          | 2.1               | 7.1       | 1.8            | 1.12 | 41                        | 42               | 35               | 23               | Loam            |
| 2.5                       | 2504.9                         | 5                            | 2502.4                            | 7.1             | 2             | 8.3               | 7.7       | 4.8            | 1.74 | 38                        | 32               | 43               | 25               | Loam            |
| 5                         | 2502.4                         | 7.5                          | 2499.9                            | 1.6             | 0.94          | 4                 | 8.1       | 3              | 1.8  | 33                        | 62               | 29               | 9                | Sandy Loam      |
| 7.5                       | 2499.9                         | 10                           | 2497.4                            | 1.2             | 1.2           | 2.1               | 8.2       | 8.8            | 6.8  | 73                        | 16               | 49               | 35               | Silty Clay Loam |
| 10                        | 2497.4                         | 12.5                         | 2494.9                            | 1.4             | 1.7           | 3.4               | 8.2       | 11.5           | 7.43 | 61                        | 26               | 53               | 21               | Silt Loam       |
| 12.5                      | 2494.9                         | 15                           | 2492.4                            | 1.9             | 1.6           | 2.3               | 7.9       | 11.7           | 8.1  | 88                        | 18               | 55               | 27               | Silty Clay Loam |
| 15                        | 2492.4                         | 17.5                         | 2489.9                            | 1.9             | 1.6           | 2.2               | 7.9       | 12             | 8.4  | 88                        | 16               | 53               | 31               | Silty Clay Loam |
| 17.5                      | 2489.9                         | 20                           | 2487.4                            | 2.3             | 2.1           | 2.6               | 7.9       | 16.9           | 10.7 | 100                       | 8                | 49               | 43               | Silty Clay      |
| 20                        | 2487.4                         | 25                           | 2482.4                            | 0.6             | 1.4           | 0.8               | 8.6       | 12.7           | 15.2 | 100                       | 24               | 51               | 25               | Silt Loam       |
| 25                        | 2482.4                         | 30                           | 2477.4                            | 0.5             | 1.8           | 0.8               | 8.5       | 17.8           | 22.1 | 130                       | 6                | 56               | 38               | Silty Clay Loam |
| 30                        | 2477.4                         | 35                           | 2472.4                            | 0.5             | 2.4           | 0.7               | 8.8       | 24.1           | 30.7 | 100                       | 36               | 40               | 24               | Loam            |
| 35                        | 2472.4                         | 40                           | 2467.4                            | 0.6             | 2.9           | 0.8               | 8.9       | 28             | 33.8 | 90                        | 46               | 31               | 23               | Loam            |
| 40                        | 2467.4                         | 45                           | 2462.4                            | 0.5             | 2.6           | 0.6               | 8.9       | 24.7           | 33.4 | 90                        | 47               | 33               | 20               | Loam            |
| 45                        | 2462.4                         | 50                           | 2457.4                            | 0.6             | 2.8           | 0.9               | 8.6       | 27.2           | 31.3 | 74                        | 62               | 23               | 15               | Sandy Loam      |
| 65                        | 2442.4                         | 70                           | 2437.4                            | 0.3             | 1.9           | 0.4               | 7.8       | 19.9           | 32.4 | 130                       | 18               | 44               | 38               | Silty Clay Loam |
| 70                        | 2437.4                         | 75                           | 2432.4                            | 0.2             | 1.7           | 0.3               | 8.3       | 18.3           | 35.9 | 140                       | 1                | 29               | 70               | Clay            |
| 75                        | 2432.4                         | 80                           | 2427.4                            | 0.2             | 1.7           | 0.2               | 8.7       | 18.6           | 42.4 | 140                       | 1                | 47               | 53               | Silty Clay      |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 0.76 | 0.2  | 7.1  | 1.8   | 1.12  | 33    | 1  | 23 | 9  |
| Average | 1.43 | 1.83 | 1.91 | 8.24 | 15.40 | 19.02 | 89.18 | 27 | 42 | 31 |
| Max     | 7.1  | 2.9  | 8.3  | 8.9  | 28    | 42.4  | 140   | 62 | 56 | 70 |
| Number  | 17   | 17   | 17   | 17   | 17    | 17    | 17    | 17 | 17 | 17 |

Depth to Coal: 50'

Statistical Summary Above Coal

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.5  | 0.76 | 0.6  | 7.1  | 1.8   | 1.12  | 33    | 6  | 23 | 9  |
| Average | 1.69 | 1.84 | 2.26 | 8.24 | 14.64 | 15.19 | 79.00 | 32 | 43 | 26 |
| Max     | 7.1  | 2.9  | 8.3  | 8.9  | 28    | 33.8  | 130   | 62 | 56 | 43 |
| Number  | 14   | 14   | 14   | 14   | 14    | 14    | 14    | 14 | 14 | 14 |

NOTES:

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- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
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- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.77

OVERBURDEN ANALYSIS DATA FOR SHOB-124R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2508.6                         | 2.5                          | 2506.1                            | 1.9             | 1.1           | 2.1               | 7.5       | 6.9            | 4.84 | 51                        | 26               | 41               | 33               | Clay Loam       |
| 2.5                       | 2506.1                         | 5                            | 2503.6                            | 4.7             | 3.8           | 11.6              | 8         | 26.9           | 9.43 | 91                        | 8                | 43               | 49               | Silty Clay      |
| 5                         | 2503.6                         | 7.5                          | 2501.1                            | 5.9             | 4.2           | 10.3              | 8         | 33.5           | 11.8 | 58                        | 24               | 54               | 22               | Silt Loam       |
| 7.5                       | 2501.1                         | 10                           | 2498.6                            | 1.4             | 3.2           | 2.8               | 8.2       | 28.9           | 20   | 150                       | 4                | 48               | 48               | Silty Clay      |
| 10                        | 2498.6                         | 12.5                         | 2496.1                            | 10.7            | 6.3           | 15.2              | 7.9       | 57.8           | 16   | 100                       | 6                | 57               | 37               | Silty Clay Loam |
| 12.5                      | 2496.1                         | 15                           | 2493.6                            | 25.1            | 10            | 30.9              | 7.8       | 101            | 19   | 93                        | 26               | 46               | 28               | Clay Loam       |
| 15                        | 2493.6                         | 17.5                         | 2491.1                            | 18.8            | 7.1           | 17.8              | 7.9       | 63.8           | 14.9 | 140                       | 15               | 49               | 36               | Silty Clay Loam |
| 17.5                      | 2491.1                         | 20                           | 2488.6                            | 2.3             | 5.6           | 4                 | 8.3       | 58.4           | 32.8 | 170                       | 10               | 56               | 34               | Silty Clay Loam |
| 20                        | 2488.6                         | 25                           | 2483.6                            | 1.1             | 3.8           | 2.1               | 8.7       | 38.1           | 30.3 | 120                       | 16               | 58               | 26               | Silt Loam       |
| 25                        | 2483.6                         | 30                           | 2478.6                            | 0.8             | 3.6           | 1.3               | 8.7       | 37.1           | 35.9 | 100                       | 37               | 39               | 24               | Loam            |
| 30                        | 2478.6                         | 35                           | 2473.6                            | 0.3             | 2.6           | 0.4               | 8.9       | 26.4           | 42.6 | 92                        | 52               | 24               | 24               | Sandy Clay Loam |
| 35                        | 2473.6                         | 40                           | 2468.6                            | 0.3             | 2.2           | 0.4               | 8.8       | 21.8           | 38.3 | 100                       | 29               | 45               | 26               | Loam            |
| 40                        | 2468.6                         | 45                           | 2463.6                            | 0.3             | 1.9           | 0.4               | 8.7       | 20.7           | 34.2 | 82                        | 44               | 35               | 21               | Loam            |
| 65                        | 2443.6                         | 70                           | 2438.6                            | 0.2             | 1.6           | 0.3               | 7.6       | 16.3           | 33.4 | 150                       | 16               | 26               | 58               | Clay            |
| 70                        | 2438.6                         | 75                           | 2433.6                            | 0.2             | 1.6           | 0.2               | 8.5       | 16.7           | 35.4 | 150                       | 1                | 35               | 65               | Clay            |
| 75                        | 2433.6                         | 80                           | 2428.6                            | 0.2             | 1.6           | 0.2               | 8.8       | 16.4           | 39.9 | 140                       | 12               | 51               | 37               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |      |       |       |        |    |    |    |
|---------|------|------|------|------|-------|-------|--------|----|----|----|
| Min     | 0.2  | 1.1  | 0.2  | 7.5  | 6.9   | 4.84  | 51     | 1  | 24 | 21 |
| Average | 4.64 | 3.76 | 6.25 | 8.27 | 35.67 | 26.17 | 111.69 | 20 | 44 | 36 |
| Max     | 25.1 | 10   | 30.9 | 8.9  | 101   | 42.6  | 170    | 52 | 58 | 65 |
| Number  | 16   | 16   | 16   | 16   | 16    | 16    | 16     | 16 | 16 | 16 |

Depth to Coal: 45'

Statistical Summary Above Coal

|         |      |      |      |      |       |       |        |    |    |    |
|---------|------|------|------|------|-------|-------|--------|----|----|----|
| Min     | 0.3  | 1.1  | 0.4  | 7.5  | 6.9   | 4.84  | 51     | 4  | 24 | 21 |
| Average | 5.66 | 4.26 | 7.64 | 8.26 | 40.10 | 23.85 | 103.62 | 23 | 46 | 31 |
| Max     | 25.1 | 10   | 30.9 | 8.9  | 101   | 42.6  | 170    | 52 | 58 | 49 |
| Number  | 13   | 13   | 13   | 13   | 13    | 13    | 13     | 13 | 13 | 13 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.78

OVERBURDEN ANALYSIS DATA FOR SHOB-125R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2584.8                         | 2.5                          | 2582.3                            | 1.3             | 0.62          | 1.5               | 7.9       | 3.7            | 3.11 | 83                        | 7                | 37               | 56               | Clay            |
| 2.5                       | 2582.3                         | 5                            | 2579.8                            | 24.9            | 5.5           | 31.2              | 7.7       | 28.9           | 5.46 | 80                        | 1                | 50               | 50               | Silty Clay      |
| 5                         | 2579.8                         | 7.5                          | 2577.3                            | 22.1            | 11            | 62.5              | 3.9       | 106            | 16.4 | 130                       | 56               | 30               | 14               | Sandy Loam      |
| 7.5                       | 2577.3                         | 10                           | 2574.8                            | 23.5            | 10            | 46.7              | 4.1       | 95             | 16   | 88                        | 2                | 43               | 55               | Silty Clay      |
| 10                        | 2574.8                         | 12.5                         | 2572.3                            | 20.9            | 8.7           | 37.6              | 4.3       | 76.3           | 14.1 | 110                       | 2                | 38               | 60               | Clay            |
| 12.5                      | 2572.3                         | 15                           | 2569.8                            | 13.5            | 7.6           | 28.8              | 5.1       | 67.6           | 14.7 | 110                       | 2                | 42               | 56               | Silty Clay      |
| 15                        | 2569.8                         | 17.5                         | 2567.3                            | 22.4            | 9.4           | 48.3              | 5         | 83.5           | 14   | 96                        | 10               | 48               | 42               | Silty Clay      |
| 17.5                      | 2567.3                         | 20                           | 2564.8                            | 22.6            | 10            | 49.6              | 6.9       | 95.5           | 15.9 | 78                        | 18               | 46               | 36               | Silty Clay Loam |
| 20                        | 2564.8                         | 25                           | 2559.8                            | 8.9             | 7.8           | 20.8              | 6.6       | 72.6           | 18.8 | 98                        | 6                | 60               | 34               | Silty Clay Loam |
| 25                        | 2559.8                         | 30                           | 2554.8                            | 15.7            | 8.7           | 28.8              | 7.5       | 82.8           | 17.5 | 84                        | 4                | 62               | 34               | Silty Clay Loam |
| 30                        | 2554.8                         | 35                           | 2549.8                            | 4.8             | 8.9           | 8.2               | 7.9       | 99.2           | 39   | 96                        | 4                | 62               | 34               | Silty Clay Loam |
| 35                        | 2549.8                         | 40                           | 2544.8                            | 3.9             | 7.4           | 5.5               | 8.4       | 78.6           | 36.3 | 76                        | 2                | 71               | 27               | Silty Clay Loam |
| 40                        | 2544.8                         | 45                           | 2539.8                            | 4.4             | 9             | 6                 | 8.5       | 98.8           | 43.3 | 82                        | 2                | 66               | 32               | Silty Clay Loam |
| 45                        | 2539.8                         | 50                           | 2534.8                            | 2.8             | 6.3           | 2.6               | 8.8       | 64.4           | 39   | 82                        | 3                | 68               | 29               | Silty Clay Loam |
| 50                        | 2534.8                         | 55                           | 2529.8                            | 1               | 5.4           | 1.1               | 8.9       | 56.3           | 55.1 | 110                       | 16               | 50               | 34               | Silty Clay Loam |
| 55                        | 2529.8                         | 60                           | 2524.8                            | 5.6             | 7.1           | 6.1               | 8.4       | 73.3           | 30.3 | 46                        | 39               | 43               | 18               | Loam            |
| 60                        | 2524.8                         | 65                           | 2519.8                            | 0.6             | 3.6           | 0.8               | 8.7       | 35             | 41.6 | 72                        | 23               | 45               | 32               | Clay Loam       |
| 65                        | 2519.8                         | 70                           | 2514.8                            | 0.2             | 2.6           | 0.2               | 8.9       | 24.6           | 49.8 | 93                        | 9                | 63               | 28               | Silty Clay Loam |
| 70                        | 2514.8                         | 75                           | 2509.8                            | 0.1             | 2.1           | 0.2               | 9.1       | 20.2           | 53   | 130                       | 5                | 64               | 31               | Silty Clay Loam |
| 75                        | 2509.8                         | 80                           | 2504.8                            | 0.2             | 2.3           | 0.2               | 9.3       | 22.1           | 48.2 | 130                       | 35               | 39               | 26               | Loam            |
| 80                        | 2504.8                         | 85                           | 2499.8                            | 0.2             | 2.3           | 0.2               | 9.3       | 22.1           | 52.7 | 130                       | 47               | 28               | 25               | Loam            |
| 85                        | 2499.8                         | 90                           | 2494.8                            | 0.2             | 1.9           | 0.2               | 9.3       | 19.8           | 42.3 | 130                       | 56               | 22               | 22               | Sandy Clay Loam |
| 90                        | 2494.8                         | 95                           | 2489.8                            | 0.2             | 1.8           | 0.2               | 9.3       | 18.7           | 40.2 | 130                       | 56               | 20               | 24               | Sandy Clay Loam |
| 95                        | 2489.8                         | 100                          | 2484.8                            | 0.2             | 1.9           | 0.2               | 9.3       | 19.4           | 44   | 120                       | 61               | 16               | 23               | Sandy Clay Loam |
| 100                       | 2484.8                         | 105                          | 2479.8                            | 1.2             | 4.3           | 1.6               | 7.9       | 40.7           | 34.4 | 69                        | 70               | 14               | 16               | Sandy Loam      |
| 120                       | 2464.8                         | 125                          | 2459.8                            | 0.4             | 2.6           | 0.6               | 8.8       | 26.8           | 37.3 | 84                        | 19               | 57               | 24               | Silt Loam       |
| 125                       | 2459.8                         | 130                          | 2454.8                            | 0.7             | 4             | 1.2               | 8.4       | 41.9           | 43.1 | 87                        | 35               | 43               | 22               | Loam            |
| 130                       | 2454.8                         | 135                          | 2449.8                            | 0.5             | 3.1           | 0.5               | 9         | 31.2           | 44.6 | 51                        | 65               | 25               | 10               | Sandy Loam      |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.1  | 0.62 | 0.2   | 3.9  | 3.7   | 3.11  | 46    | 1  | 14 | 10 |
| Average | 7.25 | 5.57 | 13.98 | 7.76 | 53.75 | 32.51 | 95.54 | 23 | 45 | 32 |
| Max     | 24.9 | 11   | 62.5  | 9.3  | 106   | 55.1  | 130   | 70 | 71 | 60 |
| Number  | 28   | 28   | 28    | 28   | 28    | 28    | 28    | 28 | 28 | 28 |

Depth to Coal: 105'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.1  | 0.62 | 0.2   | 3.9  | 3.7   | 3.11  | 46    | 1  | 14 | 14 |
| Average | 8.06 | 5.85 | 15.56 | 7.64 | 56.20 | 31.41 | 98.12 | 21 | 45 | 34 |
| Max     | 24.9 | 11   | 62.5  | 9.3  | 106   | 55.1  | 130   | 70 | 71 | 60 |
| Number  | 25   | 25   | 25    | 25   | 25    | 25    | 25    | 25 | 25 | 25 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.79

OVERBURDEN ANALYSIS DATA FOR SHOB-126R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2603.4                         | 2.5                          | 2600.9                            | 0.9             | 1.2           | 1.8               | 8.3       | 11.4           | 9.91 | 90                        |                  |                  |                  |                 |
| 2.5                       | 2600.9                         | 5                            | 2598.4                            | 22.8            | 11            | 84.6              | 8.2       | 101            | 13.8 | 100                       | 1                | 49               | 51               | Silty Clay      |
| 5                         | 2598.4                         | 7.5                          | 2595.9                            | 21.7            | 10            | 60.3              | 7.1       | 90.9           | 14.2 | 100                       | 1                | 45               | 55               | Silty Clay      |
| 7.5                       | 2595.9                         | 10                           | 2593.4                            | 23.9            | 9.1           | 40.9              | 3.8       | 80.4           | 14.1 | 130                       | 62               | 26               | 12               | Sandy Loam      |
| 10                        | 2593.4                         | 12.5                         | 2590.9                            | 25.2            | 7.1           | 31                | 3.9       | 53.2           | 10   | 56                        | 20               | 39               | 41               | Clay            |
| 12.5                      | 2590.9                         | 15                           | 2588.4                            | 24              | 5.6           | 29.7              | 7         | 32.3           | 6.23 | 57                        | 1                | 70               | 30               | Silty Clay Loam |
| 15                        | 2588.4                         | 17.5                         | 2585.9                            | 23              | 5.3           | 29.3              | 7.7       | 31             | 6.05 | 60                        | 1                | 65               | 35               | Silty Clay Loam |
| 17.5                      | 2585.9                         | 20                           | 2583.4                            | 8.1             | 3.7           | 14.4              | 8.1       | 26.8           | 7.98 | 44                        | 6                | 69               | 25               | Silt Loam       |
| 20                        | 2583.4                         | 25                           | 2578.4                            | 24.4            | 5             | 28.6              | 7.8       | 25.7           | 4.98 | 32                        | 44               | 47               | 9                | Loam            |
| 25                        | 2578.4                         | 30                           | 2573.4                            | 2.3             | 1.9           | 4.8               | 8.3       | 14.7           | 7.77 | 36                        | 56               | 37               | 7                | Sandy Loam      |
| 30                        | 2573.4                         | 35                           | 2568.4                            | 4.3             | 2.7           | 8.4               | 8.2       | 18.6           | 7.36 | 35                        | 50               | 43               | 7                | Loam            |
| 35                        | 2568.4                         | 40                           | 2563.4                            | 5.6             | 3.1           | 10.3              | 8.3       | 21.1           | 7.49 | 32                        | 64               | 29               | 7                | Sandy Loam      |
| 40                        | 2563.4                         | 45                           | 2558.4                            | 7.1             | 3.1           | 11.4              | 8.1       | 19.9           | 6.57 | 34                        | 78               | 16               | 6                | Loamy Sand      |
| 45                        | 2558.4                         | 50                           | 2553.4                            | 2.8             | 2.6           | 6                 | 8.3       | 20.4           | 9.76 | 32                        | 72               | 19               | 9                | Sandy Loam      |
| 50                        | 2553.4                         | 55                           | 2548.4                            | 9.2             | 3.5           | 13                | 8.1       | 20.2           | 6.06 | 34                        | 82               | 11               | 7                | Loamy Sand      |
| 55                        | 2548.4                         | 60                           | 2543.4                            | 4.9             | 3             | 8.8               | 8.2       | 20.8           | 7.95 | 32                        | 83               | 10               | 7                | Loamy Sand      |
| 60                        | 2543.4                         | 65                           | 2538.4                            | 2.9             | 2.6           | 5.6               | 8.3       | 20.8           | 10.1 | 34                        | 82               | 11               | 7                | Loamy Sand      |
| 65                        | 2538.4                         | 70                           | 2533.4                            | 24.3            | 5.5           | 24.9              | 7.9       | 32.7           | 6.6  | 32                        | 66               | 25               | 9                | Sandy Loam      |
| 70                        | 2533.4                         | 75                           | 2528.4                            | 23.3            | 4.9           | 20.9              | 8         | 29.7           | 6.32 | 33                        | 70               | 21               | 9                | Sandy Loam      |
| 75                        | 2528.4                         | 80                           | 2523.4                            | 18.1            | 5.3           | 23.9              | 7.8       | 38.1           | 8.33 | 32                        | 56               | 31               | 13               | Sandy Loam      |
| 80                        | 2523.4                         | 85                           | 2518.4                            | 21.6            | 5.7           | 30.3              | 7.8       | 36.6           | 7.18 | 42                        | 35               | 46               | 19               | Loam            |
| 85                        | 2518.4                         | 90                           | 2513.4                            | 22              | 5.4           | 30.2              | 7.9       | 33.8           | 6.61 | 46                        |                  |                  |                  |                 |
| 100                       | 2503.4                         | 105                          | 2498.4                            | 2.6             | 1.8           | 3.1               | 8.2       | 15.3           | 9.04 | 110                       | 6                | 44               | 50               | Silty Clay      |
| 110                       | 2493.4                         | 115                          | 2488.4                            | 6.6             | 4.3           | 8.8               | 7.5       | 37.8           | 13.6 | 82                        |                  |                  |                  |                 |
| 115                       | 2488.4                         | 120                          | 2483.4                            | 2.5             | 3.9           | 3.1               | 7.3       | 41.7           | 25   | 92                        | 52               | 29               | 19               | Loam            |
| 130                       | 2473.4                         | 135                          | 2468.4                            | 0.4             | 2.5           | 0.4               | 8.3       | 30             | 48.1 | 130                       | 22               | 41               | 37               | Clay Loam       |
| 135                       | 2468.4                         | 140                          | 2463.4                            | 0.3             | 2.3           | 0.3               | 8.5       | 25.7           | 46   | 110                       | 10               | 67               | 23               | Silt Loam       |
| 140                       | 2463.4                         | 145                          | 2458.4                            | 0.2             | 1.9           | 0.2               | 8.8       | 20.7           | 45.1 | 110                       | 48               | 31               | 21               | Loam            |

Statistical Summary

|         |       |      |       |      |       |       |       |    |    |    |
|---------|-------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2   | 1.2  | 0.2   | 3.8  | 11.4  | 4.98  | 32    | 1  | 10 | 6  |
| Average | 11.96 | 4.43 | 19.11 | 7.70 | 33.98 | 13.29 | 62.75 | 43 | 37 | 21 |
| Max     | 25.2  | 11   | 84.6  | 8.8  | 101   | 48.1  | 130   | 83 | 70 | 55 |
| Number  | 28    | 28   | 28    | 28   | 28    | 28    | 28    | 25 | 25 | 25 |

Depth to Coal: 120'

Statistical Summary Above Coal

|         |       |      |       |      |       |      |       |    |    |    |
|---------|-------|------|-------|------|-------|------|-------|----|----|----|
| Min     | 0.9   | 1.2  | 1.8   | 3.8  | 11.4  | 4.98 | 32    | 1  | 10 | 6  |
| Average | 13.36 | 4.69 | 21.36 | 7.60 | 35.00 | 9.32 | 56.28 | 45 | 36 | 20 |
| Max     | 25.2  | 11   | 84.6  | 8.3  | 101   | 25   | 130   | 83 | 70 | 55 |
| Number  | 25    | 25   | 25    | 25   | 25    | 25   | 25    | 22 | 22 | 22 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.80

OVERBURDEN ANALYSIS DATA FOR SHOB-127RB

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture          |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|------------------|
| 0                         | 2510.8                         | 2.5                          | 2508.3                            |                 |               |                   |           |                |      |                           | 41               | 29               | 30               | Clay Loam        |
| 2.5                       | 2508.3                         | 5                            | 2505.8                            | 1.4             | 0.4           | 0.86              | 7         | 1.5            | 1.38 | 88.1                      | 27               | 34               | 39               | Clay Loam        |
| 5                         | 2505.8                         | 7.5                          | 2503.3                            | 1.3             | 0.35          | 0.82              | 7.2       | 1.4            | 1.32 | 84.5                      | 9                | 47               | 44               | Silty Clay       |
| 7.5                       | 2503.3                         | 10                           | 2500.8                            | 3.4             | 0.68          | 2                 | 7.8       | 2              | 1.25 | 93.6                      | 9                | 47               | 44               | Silty Clay       |
| 10                        | 2500.8                         | 12.5                         | 2498.3                            | 2.4             | 0.54          | 1.4               | 7.9       | 1.6            | 1.19 | 103                       | 35               | 27               | 38               | Clay Loam        |
| 12.5                      | 2498.3                         | 15                           | 2495.8                            | 1.9             | 0.45          | 0.98              | 7.9       | 2              | 1.66 | 77.6                      | 39               | 26               | 35               | Clay Loam        |
| 15                        | 2495.8                         | 17.5                         | 2493.3                            | 25              | 2.97          | 11                | 7.5       | 5.6            | 1.32 | 141                       | 43               | 21               | 36               | Clay Loam        |
| 17.5                      | 2493.3                         | 20                           | 2490.8                            | 2.1             | 0.68          | 1.2               | 7.7       | 3.3            | 2.6  | 98.6                      | 48               | 21               | 31               | Sandy Clay Loam  |
| 20                        | 2490.8                         | 25                           | 2485.8                            | 0.62            | 1.07          | 0.64              | 8         | 9.6            | 12.1 | 97.2                      | 41               | 25               | 34               | Clay Loam        |
| 25                        | 2485.8                         | 30                           | 2480.8                            | 1.6             | 1.21          | 0.89              | 8         | 11             | 9.66 | 101                       | 25               | 39               | 36               | Clay Loam        |
| 30                        | 2480.8                         | 35                           | 2475.8                            | 1.1             | 1.01          | 0.72              | 8         | 9.1            | 9.69 | 108                       | 18               | 38               | 44               | Clay             |
| 35                        | 2475.8                         | 40                           | 2470.8                            | 1               | 0.93          | 0.62              | 8.2       | 8.4            | 9.35 | 108                       | 19               | 38               | 43               | Clay             |
| 40                        | 2470.8                         | 45                           | 2465.8                            | 0.8             | 0.68          | 0.25              | 8.2       | 6.3            | 8.64 | 86                        | 21               | 39               | 40               | Clay - Clay Loam |
| 45                        | 2465.8                         | 50                           | 2460.8                            | 0.96            | 0.85          | 0.55              | 8.3       | 7.7            | 8.95 | 58.8                      | 25               | 38               | 37               | Clay Loam        |
| 50                        | 2460.8                         | 55                           | 2455.8                            | 0.8             | 0.78          | 0.32              | 8.3       | 6.9            | 9.27 | 84.2                      | 35               | 34               | 31               | Clay Loam        |
| 55                        | 2455.8                         | 60                           | 2450.8                            | 0.97            | 1.12          | 0.62              | 8.1       | 9.5            | 10.7 | 67.2                      | 65               | 18               | 17               | Sandy Loam       |
| 60                        | 2450.8                         | 65                           | 2445.8                            | 0.73            | 1.18          | 0.45              | 8.5       | 11             | 14.4 | 59.7                      | 63               | 21               | 16               | Sandy Loam       |
| 65                        | 2445.8                         | 70                           | 2440.8                            | 24              | 5.2           | 12                | 8.1       | 32             | 7.5  | 61.7                      | 75               | 14               | 11               | Sandy Loam       |
| 70                        | 2440.8                         | 75                           | 2435.8                            | 14              | 4.24          | 7.1               | 8.3       | 27             | 8.35 | 48.9                      | 81               | 12               | 7                | Loamy Sand       |
| 75                        | 2435.8                         | 80                           | 2430.8                            | 0.44            | 1.23          | 0.26              | 8.9       | 11             | 18.1 | 42.5                      | 83               | 8                | 9                | Loamy Sand       |

Statistical Summary

|         |      |      |      |      |      |      |       |    |    |    |
|---------|------|------|------|------|------|------|-------|----|----|----|
| Min     | 0.44 | 0.35 | 0.25 | 7    | 1.4  | 1.19 | 42.5  | 9  | 8  | 7  |
| Average | 4.45 | 1.35 | 2.25 | 7.99 | 8.78 | 7.23 | 84.72 | 40 | 29 | 31 |
| Max     | 25   | 5.2  | 12   | 8.9  | 32   | 18.1 | 141   | 83 | 47 | 44 |
| Number  | 19   | 19   | 19   | 19   | 19   | 19   | 19    | 20 | 20 | 20 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.81

OVERBURDEN ANALYSIS DATA FOR SHOB-128R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2506.4                         | 2.5                          | 2503.9                            | 4.2             | 0.56          | 1.7               | 7.4       | 0.99           | 0.58 | 69.3                      | 43               | 40               | 17               | Loam            |
| 2.5                       | 2503.9                         | 5                            | 2501.4                            | 2.2             | 0.37          | 0.51              | 7.6       | 1.7            | 1.48 | 40.4                      | 65               | 22               | 13               | Sandy Loam      |
| 5                         | 2501.4                         | 7.5                          | 2498.9                            | 2.1             | 0.37          | 0.76              | 7.7       | 1.8            | 1.49 | 60.2                      | 33               | 46               | 21               | Loam            |
| 7.5                       | 2498.9                         | 10                           | 2496.4                            | 2.4             | 0.45          | 0.93              | 7.5       | 2.1            | 1.65 | 60.4                      | 27               | 48               | 25               | Loam            |
| 10                        | 2496.4                         | 12.5                         | 2493.9                            | 3.4             | 1.22          | 1.7               | 7.8       | 8.7            | 5.46 | 75.1                      | 13               | 52               | 35               | Silty Clay Loam |
| 12.5                      | 2493.9                         | 15                           | 2491.4                            | 1.5             | 1.71          | 0.78              | 8.1       | 14             | 13   | 72.7                      | 24               | 47               | 29               | Clay Loam       |
| 15                        | 2491.4                         | 17.5                         | 2488.9                            | 0.98            | 2.07          | 0.32              | 8.4       | 18             | 22   | 53.1                      | 63               | 23               | 14               | Sandy Loam      |
| 17.5                      | 2488.9                         | 20                           | 2486.4                            | 0.85            | 0.88          | 0.12              | 8.2       | 7.7            | 11.1 | 59.7                      | 49               | 34               | 17               | Loam            |
| 20                        | 2486.4                         | 25                           | 2481.4                            | 0.37            | 0.76          | < 0.04            | 8.2       | 7.2            | 16   | 85.8                      | 41               | 34               | 25               | Loam            |
| 25                        | 2481.4                         | 30                           | 2476.4                            |                 |               |                   |           |                |      |                           | 35               | 36               | 29               | Clay Loam       |
| 30                        | 2476.4                         | 35                           | 2471.4                            | 0.71            | 0.72          | 0.07              | 8.2       | 6.4            | 10.2 | 76.5                      | 34               | 37               | 29               | Clay Loam       |
| 35                        | 2471.4                         | 40                           | 2466.4                            | 0.8             | 0.78          | 0.1               | 8.3       | 7.3            | 10.8 | 69.7                      | 36               | 42               | 22               | Loam            |
| 40                        | 2466.4                         | 45                           | 2461.4                            | 1.2             | 0.77          | 0.17              | 8.2       | 7.2            | 8.81 | 51.2                      | 56               | 23               | 21               | Sandy Clay Loam |
| 45                        | 2461.4                         | 50                           | 2456.4                            | 1.2             | 0.83          | 0.23              | 8.3       | 7.9            | 9.42 | 48.6                      | 68               | 18               | 14               | Sandy Loam      |
| 50                        | 2456.4                         | 55                           | 2451.4                            | 1.2             | 1.01          | 0.36              | 8.6       | 10             | 11.5 | 51.4                      | 74               | 10               | 16               | Sandy Loam      |
| 55                        | 2451.4                         | 60                           | 2446.4                            | 1.1             | 1.52          | 0.64              | 8.6       | 16             | 17   | 52.8                      | 70               | 15               | 15               | Sandy Loam      |

Statistical Summary

|         |      |      |        |      |      |      |       |    |    |    |
|---------|------|------|--------|------|------|------|-------|----|----|----|
| Min     | 0.37 | 0.37 | < 0.04 | 7.4  | 0.99 | 0.58 | 40.4  | 13 | 10 | 13 |
| Average | 1.61 | 0.93 | 0.56   | 8.07 | 7.80 | 9.37 | 61.79 | 46 | 33 | 21 |
| Max     | 4.2  | 2.07 | 1.7    | 8.6  | 18   | 22   | 85.8  | 74 | 52 | 35 |
| Number  | 15   | 15   | 15     | 15   | 15   | 15   | 15    | 16 | 16 | 16 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY
- In calculating arithmetic mean < 0.04 is assumed as 0.02

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.82

OVERBURDEN ANALYSIS DATA FOR SHOB-129R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2502.7                         | 2.5                          | 2500.2                            |                 |               |                   |           |                |      |                           | 40               | 37               | 23               | Loam            |
| 2.5                       | 2500.2                         | 5                            | 2497.7                            |                 |               |                   |           |                |      |                           | 72               | 16               | 12               | Silt Loam       |
| 5                         | 2497.7                         | 7.5                          | 2495.2                            | 2.2             | 0.44          | 0.8               | 7.7       | 2.5            | 2.03 | 53.2                      | 48               | 34               | 18               | Loam            |
| 7.5                       | 2495.2                         | 10                           | 2492.7                            | 7.7             | 1.59          | 3.5               | 7.8       | 7.6            | 3.22 | 61.5                      | 30               | 42               | 28               | Clay Loam       |
| 10                        | 2492.7                         | 12.5                         | 2490.2                            | 6.9             | 2.3           | 3.3               | 7.9       | 17             | 7.38 | 47                        | 70               | 16               | 14               | Sandy Loam      |
| 12.5                      | 2490.2                         | 15                           | 2487.7                            |                 |               |                   |           |                |      |                           | 52               | 27               | 21               | Sandy Clay Loam |
| 15                        | 2487.7                         | 17.5                         | 2485.2                            | 4.1             | 2.21          | 1.9               | 8         | 18             | 10.6 | 48.2                      | 62               | 22               | 16               | Sandy Loam      |
| 17.5                      | 2485.2                         | 20                           | 2482.7                            | 7.7             | 0.99          | 3.6               | 8         | 43             | 18.3 | 34.6                      | 80               | 10               | 10               | Sandy Loam      |
| 20                        | 2482.7                         | 25                           | 2477.7                            | 29              | 4.07          | 11                | 7.3       | 18             | 3.92 | 115                       | 64               | 18               | 18               | Sandy Loam      |
| 25                        | 2477.7                         | 30                           | 2472.7                            | 23              | 3.61          | 7.7               | 7.4       | 18             | 4.64 | 56                        | 54               | 24               | 22               | Sandy Clay Loam |
| 30                        | 2472.7                         | 35                           | 2467.7                            | 2.3             | 1.15          | 0.8               | 7.5       | 9.3            | 7.53 | 35.3                      | 70               | 14               | 16               | Sandy Loam      |
| 35                        | 2467.7                         | 40                           | 2462.7                            |                 |               |                   |           |                |      |                           | 40               | 38               | 22               | Loam            |
| 40                        | 2462.7                         | 45                           | 2457.7                            | 10              | 2.19          | 3.3               | 7.5       | 13             | 5.08 | 40.8                      | 80               | 8                | 12               | Sandy Loam      |
| 45                        | 2457.7                         | 50                           | 2452.7                            | 3.1             | 1.3           | 1.2               | 7.4       | 9.9            | 6.76 | 40.3                      | 76               | 12               | 12               | Sandy Loam      |
| 50                        | 2452.7                         | 55                           | 2447.7                            | 4.2             | 1.65          | 1.8               | 7.4       | 12             | 7.19 | 37                        | 74               | 13               | 13               | Sandy Loam      |
| 55                        | 2447.7                         | 60                           | 2442.7                            | 2.3             | 1.35          | 1.3               | 8.1       | 11             | 8.41 | 61.5                      | 65               | 21               | 14               | Sandy Loam      |
| 60                        | 2442.7                         | 65                           | 2437.7                            | 4               | 1.71          | 1.6               | 7.8       | 13             | 7.82 | 39.2                      | 77               | 7                | 16               | Sandy Loam      |
| 65                        | 2437.7                         | 68                           | 2434.7                            | 28              | 4.21          | 10                | 7.4       | 21             | 4.8  | 48.5                      | 75               | 13               | 12               | Sandy Loam      |

Statistical Summary

|         |      |      |      |      |       |      |       |    |    |    |
|---------|------|------|------|------|-------|------|-------|----|----|----|
| Min     | 2.2  | 0.44 | 0.8  | 7.3  | 2.5   | 2.03 | 34.6  | 30 | 7  | 10 |
| Average | 9.61 | 2.06 | 3.70 | 7.66 | 15.24 | 6.98 | 51.29 | 63 | 21 | 17 |
| Max     | 29   | 4.21 | 11   | 8.1  | 43    | 18.3 | 115   | 80 | 42 | 28 |
| Number  | 14   | 14   | 14   | 14   | 14    | 14   | 14    | 18 | 18 | 18 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.83

OVERBURDEN ANALYSIS DATA FOR SHOB-130R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2498.5                         | 2.5                          | 2496.0                            | 2.5             | 0.67          | 1.3               | 7.3       | 2.9            | 2.08 | 91                        |                  |                  |                  |                 |
| 2.5                       | 2496.0                         | 5                            | 2493.5                            | 3.2             | 0.68          | 1.2               | 7.4       | 2.5            | 1.65 | 63                        | 1                | 67               | 33               | Silty Clay Loam |
| 5                         | 2493.5                         | 7.5                          | 2491.0                            | 2.8             | 0.6           | 0.9               | 7.5       | 2.4            | 1.8  | 55                        | 7                | 61               | 32               | Silty Clay Loam |
| 7.5                       | 2491.0                         | 10                           | 2488.5                            | 3.1             | 0.63          | 1.1               | 7.5       | 2.2            | 1.52 | 59                        | 9                | 58               | 33               | Silty Clay Loam |
| 10                        | 2488.5                         | 12.5                         | 2486.0                            | 3.5             | 0.72          | 1.5               | 7.7       | 2.5            | 1.58 | 38                        | 43               | 42               | 15               | Loam            |
| 12.5                      | 2486.0                         | 15                           | 2483.5                            | 3.2             | 0.69          | 1.7               | 7.7       | 2.2            | 1.4  | 44                        | 33               | 44               | 23               | Loam            |
| 15                        | 2483.5                         | 17.5                         | 2481.0                            | 4.2             | 0.86          | 2.6               | 7.8       | 2.5            | 1.36 | 40                        | 37               | 42               | 21               | Loam            |
| 17.5                      | 2481.0                         | 20                           | 2478.5                            | 3.5             | 0.73          | 1.8               | 7.8       | 2.2            | 1.37 | 39                        | 39               | 42               | 19               | Loam            |
| 20                        | 2478.5                         | 25                           | 2473.5                            | 4.5             | 0.88          | 2.3               | 7.6       | 2.9            | 1.55 | 28                        | 65               | 22               | 13               | Sandy Loam      |
| 40                        | 2458.5                         | 45                           | 2453.5                            | 5.3             | 1             | 2.9               | 7.4       | 2.8            | 1.38 | 32                        | 61               | 28               | 11               | Sandy Loam      |
| 45                        | 2453.5                         | 50                           | 2448.5                            | 4.7             | 0.94          | 2.8               | 7.5       | 3              | 1.55 | 31                        | 59               | 28               | 13               | Sandy Loam      |
| 50                        | 2448.5                         | 55                           | 2443.5                            | 4.1             | 0.98          | 2.5               | 7.6       | 4.3            | 2.37 | 34                        | 58               | 29               | 13               | Sandy Loam      |
| 55                        | 2443.5                         | 60                           | 2438.5                            | 3               | 1.1           | 1.9               | 7.8       | 6.7            | 4.24 | 36                        | 55               | 30               | 15               | Sandy Loam      |

Statistical Summary

|         |      |      |      |      |      |      |       |    |    |    |
|---------|------|------|------|------|------|------|-------|----|----|----|
| Min     | 2.5  | 0.6  | 0.9  | 7.3  | 2.2  | 1.36 | 28    | 1  | 22 | 11 |
| Average | 3.66 | 0.81 | 1.88 | 7.58 | 3.01 | 1.83 | 45.38 | 39 | 41 | 20 |
| Max     | 5.3  | 1.1  | 2.9  | 7.8  | 6.7  | 4.24 | 91    | 65 | 67 | 33 |
| Number  | 13   | 13   | 13   | 13   | 13   | 13   | 13    | 12 | 12 | 12 |

Depth to Coal: 25'

Statistical Summary Above Coal

|         |      |      |      |      |      |      |       |    |    |    |
|---------|------|------|------|------|------|------|-------|----|----|----|
| Min     | 2.5  | 0.6  | 0.9  | 7.3  | 2.2  | 1.36 | 28    | 1  | 22 | 13 |
| Average | 3.39 | 0.72 | 1.60 | 7.59 | 2.48 | 1.59 | 50.78 | 29 | 47 | 24 |
| Max     | 4.5  | 0.88 | 2.6  | 7.8  | 2.9  | 2.08 | 91    | 65 | 67 | 33 |
| Number  | 9    | 9    | 9    | 9    | 9    | 9    | 9     | 8  | 8  | 8  |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.84

OVERBURDEN ANALYSIS DATA FOR SHOB-131R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2542.1                         | 2.5                          | 2539.6                            | 2.2             | 0.78          | 3.2               | 6.4       | 2.7            | 1.66 | 77                        | 6                | 49               | 45               | Silty Clay      |
| 2.5                       | 2539.6                         | 5.0                          | 2537.1                            | 0.6             | 0.61          | 0.9               | 7.9       | 5.3            | 6.07 | 73                        | 6                | 47               | 47               | Silty Clay      |
| 5                         | 2537.1                         | 7.5                          | 2534.6                            | 8.1             | 4.1           | 18.2              | 8         | 26.8           | 7.4  | 66                        | 14               | 48               | 38               | Silty Clay Loam |
| 7.5                       | 2534.6                         | 10.0                         | 2532.1                            | 8               | 4.4           | 15.7              | 8.1       | 31.7           | 9.19 | 71                        | 8                | 53               | 39               | Silty Clay Loam |
| 10                        | 2532.1                         | 12.5                         | 2529.6                            | 17.6            | 6             | 23.4              | 8         | 42.3           | 9.35 | 55                        | 20               | 45               | 35               | Silty Clay Loam |
| 12.5                      | 2529.6                         | 15.0                         | 2527.1                            | 19.7            | 5.6           | 20.7              | 7.9       | 36.8           | 8.18 | 63                        | 22               | 43               | 35               | Clay Loam       |
| 15                        | 2527.1                         | 17.5                         | 2524.6                            | 18.3            | 5.4           | 18.5              | 8         | 36.6           | 8.52 | 57                        | 20               | 46               | 34               | Silty Clay Loam |
| 17.5                      | 2524.6                         | 20.0                         | 2522.1                            | 21.2            | 5.7           | 22.3              | 8         | 37.9           | 8.12 | 64                        | 8                | 53               | 39               | Silty Clay Loam |
| 20                        | 2522.1                         | 25.0                         | 2517.1                            | 24.1            | 6.1           | 29.4              | 7.8       | 38.6           | 7.47 | 52                        | 32               | 39               | 29               | Clay Loam       |
| 25                        | 2517.1                         | 30.0                         | 2512.1                            | 24.9            | 5.7           | 31.4              | 8         | 31.6           | 5.95 | 61                        | 20               | 46               | 34               | Silty Clay Loam |
| 30                        | 2512.1                         | 35.0                         | 2507.1                            | 24.1            | 4.9           | 25.4              | 7.9       | 22.1           | 4.44 | 73                        | 10               | 49               | 41               | Silty Clay      |
| 35                        | 2507.1                         | 40.0                         | 2502.1                            | 17.4            | 3.8           | 20.1              | 8         | 16.2           | 3.74 | 68                        | 18               | 49               | 33               | Silty Clay Loam |
| 40                        | 2502.1                         | 45.0                         | 2497.1                            | 4.9             | 1.7           | 7.3               | 8.1       | 8.3            | 3.36 | 67                        | 23               | 45               | 32               | Clay Loam       |
| 45                        | 2497.1                         | 50.0                         | 2492.1                            | 5.6             | 1.7           | 7.1               | 7.9       | 8.1            | 3.2  | 44                        | 56               | 25               | 19               | Sandy Loam      |
| 50                        | 2492.1                         | 55.0                         | 2487.1                            | 3.7             | 1.7           | 4.3               | 8         | 11.6           | 5.83 | 35                        | 70               | 19               | 11               | Sandy Loam      |
| 55                        | 2487.1                         | 60.0                         | 2482.1                            | 3.6             | 3.1           | 4.6               | 8.1       | 26.7           | 13.2 | 62                        | 62               | 21               | 17               | Sandy Loam      |
| 60                        | 2482.1                         | 65.0                         | 2477.1                            | 0.8             | 1.3           | 1                 | 8.5       | 12             | 12.8 | 62                        | 74               | 15               | 11               | Sandy Loam      |
| 65                        | 2477.1                         | 70.0                         | 2472.1                            | 1.1             | 2             | 1.5               | 8.6       | 20             | 17.8 | 48                        | 76               | 15               | 9                | Sandy Loam      |
| 70                        | 2472.1                         | 75.0                         | 2467.1                            | 0.6             | 1.6           | 0.6               | 8.5       | 16.3           | 21   | 42                        | 64               | 27               | 9                | Sandy Loam      |
| 75                        | 2467.1                         | 80.0                         | 2462.1                            | 2.1             | 2.3           | 2.5               | 8.3       | 20.1           | 13.2 | 37                        | 78               | 13               | 9                | Sandy Loam      |
| 80                        | 2462.1                         | 85.0                         | 2457.1                            | 1.5             | 1.8           | 1.8               | 8.3       | 16.7           | 13   | 38                        | 82               | 10               | 8                | Loamy Sand      |
| 85                        | 2457.1                         | 90.0                         | 2452.1                            | 1.5             | 2.3           | 1.7               | 8.4       | 22.1           | 17.4 | 39                        | 82               | 9                | 9                | Loamy Sand      |
| 90                        | 2452.1                         | 95.0                         | 2447.1                            | 0.8             | 2.8           | 0.9               | 8.6       | 29.5           | 32   | 46                        | 78               | 13               | 9                | Sandy Loam      |
| 95                        | 2447.1                         | 100.0                        | 2442.1                            | 0.5             | 1.9           | 0.2               | 8.9       | 21.5           | 36.4 | 82                        | 52               | 33               | 15               | Loam            |
| 100                       | 2442.1                         | 105.0                        | 2437.1                            | 1.1             | 2.7           | 1.3               | 8.5       | 28.1           | 25.7 | 44                        | 76               | 14               | 10               | Sandy Loam      |
| 105                       | 2437.1                         | 110.0                        | 2432.1                            | 0.7             | 2.4           | 0.8               | 8.6       | 23.2           | 27   | 50                        | 74               | 15               | 11               | Sandy Loam      |
| 110                       | 2432.1                         | 115.0                        | 2427.1                            | 0.5             | 2.7           | 0.7               | 8.7       | 26.7           | 34.6 | 52                        | 76               | 13               | 11               | Sandy Loam      |
| 115                       | 2427.1                         | 120.0                        | 2422.1                            | 0.4             | 3.4           | 0.6               | 8.9       | 34.4           | 47   | 51                        | 70               | 19               | 11               | Sandy Loam      |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.4  | 0.61 | 0.2  | 6.4  | 2.7   | 1.66  | 35    | 6  | 9  | 8  |
| Average | 7.70 | 3.16 | 9.50 | 8.18 | 23.35 | 14.41 | 56.39 | 46 | 31 | 23 |
| Max     | 24.9 | 6.1  | 31.4 | 8.9  | 42.3  | 47    | 82    | 82 | 53 | 47 |
| Number  | 28   | 28   | 28   | 28   | 28    | 28    | 28    | 28 | 28 | 28 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.85

OVERBURDEN ANALYSIS DATA FOR SHOB-132R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2562.4                         | 2.5                          | 2559.9                            | 3.6             | 1             | 1.3               | 7.6       | 6.2            | 3.98 | 57                        |                  |                  |                  |                 |
| 2.5                       | 2559.9                         | 5                            | 2557.4                            | 2.4             | 8.3           | 29.9              | 8.9       | 84.7           | 21.1 | 69                        | 12               | 65               | 23               | Silt Loam       |
| 5                         | 2557.4                         | 7.5                          | 2554.9                            | 22.7            | 13            | 92.2              | 8.3       | 141            | 18.5 | 53                        | 14               | 67               | 19               | Silt Loam       |
| 7.5                       | 2554.9                         | 10                           | 2552.4                            | 23.6            | 14            | 118               | 8.4       | 132            | 15.7 | 66                        | 14               | 59               | 27               | Silty Clay Loam |
| 10                        | 2552.4                         | 12.5                         | 2549.9                            | 21.3            | 10            | 60.2              | 8.1       | 88.2           | 13.8 | 92                        | 1                | 54               | 46               | Silty Clay      |
| 12.5                      | 2549.9                         | 15                           | 2547.4                            | 21.5            | 9.9           | 55.6              | 8.1       | 84.5           | 13.6 | 80                        | 1                | 57               | 43               | Silty Clay      |
| 15                        | 2547.4                         | 17.5                         | 2544.9                            | 22.6            | 9.2           | 48.4              | 8.1       | 77.5           | 13   | 98                        | 1                | 37               | 63               | Clay            |
| 17.5                      | 2544.9                         | 20                           | 2542.4                            | 21.9            | 8.2           | 38.4              | 8         | 65.8           | 12   | 97                        | 1                | 49               | 51               | Silty Clay      |
| 20                        | 2542.4                         | 25                           | 2537.4                            | 22.7            | 8.1           | 34.1              | 8.1       | 67.2           | 12.6 | 78                        | 1                | 57               | 43               | Silty Clay      |
| 25                        | 2537.4                         | 30                           | 2532.4                            | 7.5             | 5             | 10.1              | 8.2       | 43.5           | 14.7 | 64                        | 25               | 50               | 25               | Silt Loam       |
| 30                        | 2532.4                         | 35                           | 2527.4                            | 1.2             | 3             | 1.6               | 8.5       | 28.9           | 24.3 | 150                       | 4                | 57               | 39               | Silty Clay Loam |
| 35                        | 2527.4                         | 40                           | 2522.4                            | 0.5             | 2.6           | 0.8               | 8.6       | 24.8           | 30.7 | 130                       | 48               | 26               | 26               | Sandy Clay Loam |
| 40                        | 2522.4                         | 45                           | 2517.4                            | 0.8             | 3.4           | 1.2               | 8.5       | 34.8           | 34.2 | 150                       | 4                | 39               | 57               | Clay            |
| 45                        | 2517.4                         | 50                           | 2512.4                            | 0.4             | 2.7           | 0.5               | 9         | 27.7           | 41.2 | 140                       | 5                | 62               | 33               | Silty Clay Loam |
| 50                        | 2512.4                         | 55                           | 2507.4                            | 0.2             | 2.4           | 0.4               | 9.1       | 24.1           | 42.7 | 130                       | 10               | 57               | 33               | Silty Clay Loam |
| 55                        | 2507.4                         | 60                           | 2502.4                            | 0.8             | 4.4           | 1                 | 7.5       | 45.9           | 48.1 | 110                       | 38               | 39               | 23               | Loam            |
| 75                        | 2487.4                         | 80                           | 2482.4                            | 0.4             | 1.9           | 0.6               | 8.7       | 22.2           | 32   | 120                       | 16               | 56               | 28               | Silty Clay Loam |
| 80                        | 2482.4                         | 85                           | 2477.4                            | 1               | 3             | 1.6               | 8.6       | 32             | 28   | 62                        | 52               | 33               | 15               | Loam            |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 1    | 0.4   | 7.5  | 6.2   | 3.98  | 53    | 1  | 26 | 15 |
| Average | 9.73 | 6.12 | 27.55 | 8.35 | 57.28 | 23.34 | 97.00 | 15 | 51 | 35 |
| Max     | 23.6 | 14   | 118   | 9.1  | 141   | 48.1  | 150   | 52 | 67 | 63 |
| Number  | 18   | 18   | 18    | 18   | 18    | 18    | 18    | 17 | 17 | 17 |

Depth to Coal: 60'

Statistical Summary Above Coal

|         |       |      |       |      |       |       |       |    |    |    |
|---------|-------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.2   | 1    | 0.4   | 7.5  | 6.2   | 3.98  | 53    | 1  | 26 | 19 |
| Average | 10.86 | 6.58 | 30.86 | 8.31 | 61.05 | 22.51 | 97.75 | 12 | 52 | 37 |
| Max     | 23.6  | 14   | 118   | 9.1  | 141   | 48.1  | 150   | 48 | 67 | 63 |
| Number  | 16    | 16   | 16    | 16   | 16    | 16    | 16    | 15 | 15 | 15 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.86

OVERBURDEN ANALYSIS DATA FOR SHOB-133R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2527.0                         | 2.5                          | 2524.5                            |                 |               |                   |           |                |      |                           | 31               | 33               | 36               | Clay Loam       |
| 2.5                       | 2524.5                         | 5                            | 2522.0                            |                 |               |                   |           |                |      |                           | 25               | 37               | 38               | Clay Loam       |
| 5                         | 2522.0                         | 7.5                          | 2519.5                            | 1.6             | 0.37          | 0.91              | 7.4       | 1.4            | 1.21 | 98.7                      | 35               | 40               | 25               | Loam            |
| 7.5                       | 2519.5                         | 10                           | 2517.0                            | 3.4             | 0.69          | 2                 | 7.9       | 1.9            | 1.14 | 97.8                      | 49               | 25               | 26               | Sandy Clay Loam |
| 10                        | 2517.0                         | 12.5                         | 2514.5                            | 2.5             | 0.5           | 1.4               | 8         | 1.5            | 1.05 | 119                       |                  |                  |                  |                 |
| 12.5                      | 2514.5                         | 15                           | 2512.0                            | 1.6             | 0.34          | 0.78              | 8.3       | 1.4            | 1.28 | 131                       | 39               | 37               | 24               | Loam            |
| 15                        | 2512.0                         | 17.5                         | 2509.5                            |                 |               |                   |           |                |      |                           | 55               | 12               | 33               | Sandy Clay Loam |
| 17.5                      | 2509.5                         | 20                           | 2507.0                            | 2.6             | 0.69          | 1.5               | 7.9       | 3.5            | 2.44 | 84.2                      | 39               | 27               | 34               | Clay Loam       |
| 20                        | 2507.0                         | 25                           | 2502.0                            | 1.8             | 1.27          | 1                 | 8.3       | 11             | 8.96 | 96.7                      | 65               | 19               | 16               | Sandy Loam      |
| 25                        | 2502.0                         | 30                           | 2497.0                            | 1.3             | 3.05          | 2.4               | 8.4       | 28             | 21.1 | 162                       | 43               | 26               | 31               | Clay Loam       |
| 30                        | 2497.0                         | 35                           | 2492.0                            | 0.95            | 2.38          | 1.4               | 8.9       | 22             | 20.3 | 154                       | 33               | 33               | 34               | Clay Loam       |
| 35                        | 2492.0                         | 40                           | 2487.0                            | 1               | 1.63          | 1.3               | 9.1       | 15             | 13.7 | 137                       | 27               | 41               | 32               | Clay Loam       |
| 40                        | 2487.0                         | 45                           | 2482.0                            | 1.4             | 2.04          | 2.1               | 8.6       | 18             | 13.6 | 129                       | 41               | 31               | 28               | Clay Loam       |
| 65                        | 2462.0                         | 70                           | 2457.0                            | 0.56            | 1.67          | 0.74              | 8.8       | 17             | 20.9 | 122                       | 40               | 34               | 26               | Loam            |
| 70                        | 2457.0                         | 75                           | 2452.0                            | 0.32            | 1.49          | 0.38              | 9.1       | 15             | 24.6 | 133                       | 45               | 31               | 24               | Loam            |

Statistical Summary

|         |      |      |      |      |       |       |        |    |    |    |
|---------|------|------|------|------|-------|-------|--------|----|----|----|
| Min     | 0.32 | 0.34 | 0.38 | 7.4  | 1.4   | 1.05  | 84.2   | 25 | 12 | 16 |
| Average | 1.59 | 1.34 | 1.33 | 8.39 | 11.31 | 10.86 | 122.03 | 41 | 30 | 29 |
| Max     | 3.4  | 3.05 | 2.4  | 9.1  | 28    | 24.6  | 162    | 65 | 41 | 38 |
| Number  | 12   | 12   | 12   | 12   | 12    | 12    | 12     | 14 | 14 | 14 |

Depth to Coal: 45'

Statistical Summary Above Coal

|         |      |      |      |      |       |      |        |    |    |    |
|---------|------|------|------|------|-------|------|--------|----|----|----|
| Min     | 0.95 | 0.34 | 0.78 | 7.4  | 1.4   | 1.05 | 84.2   | 25 | 12 | 16 |
| Average | 1.82 | 1.30 | 1.48 | 8.28 | 10.37 | 8.48 | 120.94 | 40 | 30 | 30 |
| Max     | 3.4  | 3.05 | 2.4  | 9.1  | 28    | 21.1 | 162    | 65 | 41 | 38 |
| Number  | 10   | 10   | 10   | 10   | 10    | 10   | 10     | 12 | 12 | 12 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
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- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-134R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2507.6                         | 2.5                          | 2505.1                            | 1.9             | 0.41          | 0.86              | 7.6       | 1.9            | 1.61 | 90.6                      | 15               | 43               | 42               | Silty Clay      |
| 2.5                       | 2505.1                         | 5                            | 2502.6                            | 1.4             | 0.45          | 0.58              | 8         | 3.3            | 3.28 | 109                       | 29               | 33               | 38               | Clay Loam       |
| 5                         | 2502.6                         | 7.5                          | 2500.1                            | 1.4             | 0.62          | 0.29              | 8.9       | 6.4            | 6.89 | 78.5                      | 62               | 17               | 21               | Sandy Clay Loam |
| 7.5                       | 2500.1                         | 10                           | 2497.6                            | 1.2             | 0.61          | 1.2               | 8.8       | 6.6            | 6.14 | 142                       | 68               | 15               | 17               | Sandy Loam      |
| 10                        | 2497.6                         | 12.5                         | 2495.1                            |                 |               |                   |           |                |      |                           | 29               | 44               | 27               | Clay Loam-Loam  |
| 12.5                      | 2495.1                         | 15                           | 2492.6                            | 0.68            | 0.72          | 0.3               | 9.1       | 7.5            | 10.8 | 100                       | 31               | 46               | 23               | Loam            |
| 17.5                      | 2490.1                         | 20                           | 2487.6                            | 0.45            | 0.86          | 0.2               | 8.3       | 8.3            | 14.6 | 69.4                      | 64               | 19               | 17               | Sandy Loam      |
| 20                        | 2487.6                         | 25                           | 2482.6                            | 0.77            | 0.7           | 0.31              | 8.3       | 6.7            | 9.09 | 67.9                      | 70               | 15               | 15               | Sandy Loam      |
| 25                        | 2482.6                         | 30                           | 2477.6                            | 0.83            | 0.66          | 0.31              | 8.4       | 6.1            | 8.12 | 72.7                      | 76               | 11               | 13               | Sandy Loam      |
| 30                        | 2477.6                         | 35                           | 2472.6                            | 1.1             | 0.74          | 0.45              | 8.4       | 6.4            | 7.36 | 74.8                      | 75               | 11               | 14               | Sandy Loam      |
| 35                        | 2472.6                         | 40                           | 2467.6                            | 0.53            | 0.66          | 0.21              | 8.5       | 6.3            | 10.4 | 70.6                      | 78               | 13               | 9                | Sandy Loam      |
| 40                        | 2467.6                         | 45                           | 2462.6                            | 0.6             | 0.94          | 0.31              | 8.2       | 9.1            | 13.5 | 54.8                      | 80               | 7                | 13               | Sandy Loam      |
| 45                        | 2462.6                         | 50                           | 2457.6                            | 0.58            | 1.29          | 0.32              | 8.3       | 12             | 18.5 | 43.5                      | 76               | 13               | 11               | Sandy Loam      |
| 50                        | 2457.6                         | 55                           | 2452.6                            | 0.54            | 1.44          | 0.36              | 8.7       | 14             | 21.5 | 40.9                      | 81               | 7                | 12               | Sandy Loam      |
| 55                        | 2452.6                         | 60                           | 2447.6                            | 0.78            | 1.59          | 0.48              | 8.8       | 16             | 19.9 | 41.5                      | 80               | 12               | 8                | Loamy Sand      |
| 60                        | 2447.6                         | 65                           | 2442.6                            | 0.59            | 1.48          | 0.37              | 9         | 15             | 21.4 | 40.4                      | 83               | 8                | 9                | Loamy Sand      |
| 65                        | 2442.6                         | 70                           | 2437.6                            | 0.68            | 1.58          | 0.43              | 8.9       | 16             | 21.1 | 41.4                      | 82               | 6                | 12               | Sandy Loam      |
| 70                        | 2437.6                         | 75                           | 2432.6                            | 0.76            | 1.68          | 0.46              | 8.6       | 17             | 21.4 | 38.7                      | 82               | 7                | 11               | Loamy Sand      |
| 75                        | 2432.6                         | 80                           | 2427.6                            | 0.69            | 2.04          | 0.49              | 8.9       | 21             | 27   | 43                        | 83               | 8                | 9                | Loamy Sand      |

Statistical Summary

|         |      |      |      |      |      |       |       |    |    |    |
|---------|------|------|------|------|------|-------|-------|----|----|----|
| Min     | 0.45 | 0.41 | 0.2  | 7.6  | 1.9  | 1.61  | 38.7  | 15 | 6  | 8  |
| Average | 0.86 | 1.03 | 0.44 | 8.54 | 9.98 | 13.48 | 67.76 | 65 | 18 | 17 |
| Max     | 1.9  | 2.04 | 1.2  | 9.1  | 21   | 27    | 142   | 83 | 46 | 42 |
| Number  | 18   | 18   | 18   | 18   | 18   | 18    | 18    | 19 | 19 | 19 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.88

OVERBURDEN ANALYSIS DATA FOR SHOB-135R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2504.7                         | 2.5                          | 2502.2                            |                 |               |                   |           |                |      |                           | 30               | 43               | 27               | Clay Loam-Loam  |
| 2.5                       | 2502.2                         | 5                            | 2499.7                            |                 |               |                   |           |                |      |                           | 36               | 41               | 23               | Loam            |
| 5                         | 2499.7                         | 7.5                          | 2497.2                            | 1               | 2.81          | 0.68              | 8.5       | 27             | 29.5 | 106                       | 31               | 43               | 26               | Loam            |
| 7.5                       | 2497.2                         | 10                           | 2494.7                            | 1.3             | 5.83          | 2                 | 8.9       | 60             | 46.7 | 130                       | 28               | 42               | 30               | Clay Loam       |
| 10                        | 2494.7                         | 12.5                         | 2492.2                            |                 |               |                   |           |                |      |                           | 44               | 36               | 20               | Loam            |
| 12.5                      | 2492.2                         | 15                           | 2489.7                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 15                        | 2489.7                         | 17.5                         | 2487.2                            | 1.1             | 4.21          | 1.2               | 8.8       | 41             | 38.5 | 104                       | 38               | 28               | 34               | Clay Loam       |
| 17.5                      | 2487.2                         | 20                           | 2484.7                            | 1.8             | 2.58          | 1.2               | 7.6       | 23             | 18.8 | 42.4                      | 66               | 8                | 26               | Sandy Clay Loam |
| 20                        | 2484.7                         | 25                           | 2479.7                            | 1.7             | 1.82          | 0.75              | 7.6       | 16             | 14.3 | 56.3                      | 74               | 11               | 15               | Sandy Loam      |
| 40                        | 2464.7                         | 45                           | 2459.7                            | 1.3             | 1.89          | 0.83              | 7.5       | 18             | 17.1 | 39.1                      | 69               | 17               | 14               | Sandy Loam      |
| 45                        | 2459.7                         | 50                           | 2454.7                            | 1.4             | 2.08          | 0.95              | 7.3       | 19             | 17.5 | 37.4                      | 62               | 25               | 13               | Sandy Loam      |
| 50                        | 2454.7                         | 55                           | 2449.7                            | 1.4             | 2.19          | 1.1               | 7.4       | 20             | 17.9 | 53.5                      | 60               | 26               | 14               | Sandy Loam      |
| 55                        | 2449.7                         | 60                           | 2444.7                            | 1.3             | 1.99          | 0.89              | 7.4       | 18             | 17.6 | 47.8                      | 64               | 20               | 16               | Sandy Loam      |
| 60                        | 2444.7                         | 65                           | 2439.7                            | 1.8             | 4.02          | 1.5               | 7.8       | 33             | 26   | 50                        | 48               | 34               | 18               | Loam            |
| 65                        | 2439.7                         | 70                           | 2434.7                            | 0.87            | 2             | 0.73              | 8         | 19             | 20.9 | 77.3                      | 42               | 34               | 24               | Loam            |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.87 | 1.82 | 0.68 | 7.3  | 16    | 14.3  | 37.4  | 28 | 8  | 13 |
| Average | 1.36 | 2.86 | 1.08 | 7.89 | 26.73 | 24.07 | 67.62 | 49 | 29 | 21 |
| Max     | 1.8  | 5.83 | 2    | 8.9  | 60    | 46.7  | 130   | 74 | 43 | 34 |
| Number  | 11   | 11   | 11   | 11   | 11    | 11    | 11    | 14 | 14 | 14 |

Depth to Coal: 25'

Statistical Summary Above Coal

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 1    | 1.82 | 0.68 | 7.6  | 16    | 14.3  | 42.4  | 28 | 8  | 15 |
| Average | 1.38 | 3.45 | 1.17 | 8.28 | 33.40 | 29.56 | 87.74 | 43 | 32 | 25 |
| Max     | 1.8  | 5.83 | 2    | 8.9  | 60    | 46.7  | 130   | 74 | 43 | 34 |
| Number  | 5    | 5    | 5    | 5    | 5     | 5     | 5     | 8  | 8  | 8  |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-136R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2514.9                         | 2.5                          | 2512.4                            |                 |               |                   |           |                |      |                           | 49               | 19               | 32               | Sandy Clay Loam |
| 2.5                       | 2512.4                         | 5                            | 2509.9                            |                 |               |                   |           |                |      |                           | 46               | 24               | 30               | Sandy Clay Loam |
| 5                         | 2509.9                         | 7.5                          | 2507.4                            | 11              | 5.09          | 15                | 8         | 37             | 10.1 | 127                       | 12               | 59               | 29               | Silty Clay Loam |
| 7.5                       | 2507.4                         | 10                           | 2504.9                            | 0.98            | 2.35          | 2.3               | 8.4       | 19             | 15.1 | 237                       | 32               | 37               | 31               | Clay Loam       |
| 10                        | 2504.9                         | 12.5                         | 2502.4                            | 5               | 3.43          | 6.3               | 8.2       | 26             | 11   | 183                       | 37               | 27               | 36               | Clay Loam       |
| 12.5                      | 2502.4                         | 15                           | 2499.9                            | 1.1             | 2.12          | 1.6               | 8.3       | 18             | 15.4 | 105                       | 58               | 12               | 30               | Sandy Clay Loam |
| 15                        | 2499.9                         | 17.5                         | 2497.4                            | 0.25            | 1.04          | 0.31              | 8.6       | 9.3            | 17.7 | 92.5                      | 66               | 17               | 17               | Sandy Loam      |
| 17.5                      | 2497.4                         | 20                           | 2494.9                            | 0.28            | 1.07          | 0.42              | 8.6       | 9.7            | 16.5 | 88.4                      | 64               | 21               | 15               | Sandy Loam      |
| 20                        | 2494.9                         | 25                           | 2489.9                            |                 |               |                   |           |                |      |                           | 71               | 14               | 15               | Silt Loam       |
| 25                        | 2489.9                         | 30                           | 2484.9                            |                 |               |                   |           |                |      |                           | 74               | 13               | 13               | Silt Loam       |
| 30                        | 2484.9                         | 35                           | 2479.9                            |                 |               |                   |           |                |      |                           | 72               | 14               | 14               | Silt Loam       |
| 35                        | 2479.9                         | 40                           | 2474.9                            | 1.3             | 0.97          | 1.1               | 7.1       | 7.4            | 6.81 | 80.9                      | 80               | 11               | 9                | Loamy Sand      |
| 60                        | 2454.9                         | 65                           | 2449.9                            | 0.65            | 1.4           | 0.68              | 8.8       | 12             | 15   | 114                       | 80               | 9                | 11               | Sandy Loam      |
| 65                        | 2449.9                         | 70                           | 2444.9                            | 1.2             | 1.47          | 0.96              | 8.7       | 13             | 12.6 | 112                       | 4                | 49               | 47               | Silty Clay      |
| 70                        | 2444.9                         | 75                           | 2439.9                            | 1.2             | 1.77          | 0.83              | 9.2       | 16             | 16.2 | 111                       | 11               | 56               | 33               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |      |       |       |        |    |    |    |
|---------|------|------|------|------|-------|-------|--------|----|----|----|
| Min     | 0.25 | 0.97 | 0.31 | 7.1  | 7.4   | 6.81  | 80.9   | 4  | 9  | 9  |
| Average | 2.30 | 2.07 | 2.95 | 8.39 | 16.74 | 13.64 | 125.08 | 50 | 25 | 24 |
| Max     | 11   | 5.09 | 15   | 9.2  | 37    | 17.7  | 237    | 80 | 59 | 47 |
| Number  | 10   | 10   | 10   | 10   | 10    | 10    | 10     | 15 | 15 | 15 |

Depth to Coal: 40'

Statistical Summary Above Coal

|         |      |      |      |      |       |       |        |    |    |    |
|---------|------|------|------|------|-------|-------|--------|----|----|----|
| Min     | 0.25 | 0.97 | 0.31 | 7.1  | 7.4   | 6.81  | 80.9   | 12 | 11 | 9  |
| Average | 2.84 | 2.30 | 3.86 | 8.17 | 18.06 | 13.23 | 130.54 | 55 | 22 | 23 |
| Max     | 11   | 5.09 | 15   | 8.6  | 37    | 17.7  | 237    | 80 | 59 | 36 |
| Number  | 7    | 7    | 7    | 7    | 7     | 7     | 7      | 12 | 12 | 12 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.90

OVERBURDEN ANALYSIS DATA FOR SHOB-137R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture          |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|------------------|
| 0                         | 2512.0                         | 2.5                          | 2509.5                            | 0.98            | 0.67          | 0.47              | 8.3       | 5.8            | 6.83 | 148                       | 24               | 41               | 35               | Clay Loam        |
| 2.5                       | 2509.5                         | 5                            | 2507.0                            | 3.7             | 0.83          | 1.9               | 7.4       | 3.9            | 2.35 | 73.1                      | 12               | 51               | 37               | Silty Clay Loam  |
| 5                         | 2507.0                         | 7.5                          | 2504.5                            | 3.9             | 1.1           | 2                 | 7.5       | 6.7            | 3.91 | 73.6                      | 25               | 44               | 31               | Clay Loam        |
| 7.5                       | 2504.5                         | 10                           | 2502.0                            | 2.8             | 0.73          | 1.4               | 7.7       | 4.2            | 2.93 | 75.7                      | 36               | 34               | 30               | Clay Loam        |
| 10                        | 2502.0                         | 12.5                         | 2499.5                            | 2.2             | 0.71          | 1.1               | 7.9       | 4.7            | 3.63 | 73.7                      | 42               | 31               | 27               | Clay Loam - Loam |
| 12.5                      | 2499.5                         | 15                           | 2497.0                            | 3.1             | 1.66          | 1.9               | 7         | 13             | 8.44 | 138                       | 35               | 34               | 31               | Clay Loam        |
| 25                        | 2487.0                         | 30                           | 2482.0                            | 4.3             | 2.2           | 2.8               | 6.8       | 18             | 9.38 | 193                       | 46               | 25               | 29               | Sandy Clay Loam  |
| 30                        | 2482.0                         | 35                           | 2477.0                            | 7.2             | 2.59          | 5.2               | 6.6       | 19             | 7.52 | 149                       | 52               | 27               | 21               | Sandy Clay Loam  |

Statistical Summary

|         |      |      |      |      |      |      |        |    |    |    |
|---------|------|------|------|------|------|------|--------|----|----|----|
| Min     | 0.98 | 0.67 | 0.47 | 6.6  | 3.9  | 2.35 | 73.1   | 12 | 25 | 21 |
| Average | 3.52 | 1.31 | 2.10 | 7.40 | 9.41 | 5.62 | 115.51 | 34 | 36 | 30 |
| Max     | 7.2  | 2.59 | 5.2  | 8.3  | 19   | 9.38 | 193    | 52 | 51 | 37 |
| Number  | 8    | 8    | 8    | 8    | 8    | 8    | 8      | 8  | 8  | 8  |

Depth to Coal: 25'

Statistical Summary Above Coal

|         |      |      |      |      |      |      |       |    |    |    |
|---------|------|------|------|------|------|------|-------|----|----|----|
| Min     | 0.98 | 0.67 | 0.47 | 7    | 3.9  | 2.35 | 73.1  | 12 | 31 | 27 |
| Average | 2.78 | 0.95 | 1.46 | 7.63 | 6.38 | 4.68 | 97.02 | 29 | 39 | 32 |
| Max     | 3.9  | 1.66 | 2    | 8.3  | 13   | 8.44 | 148   | 42 | 51 | 37 |
| Number  | 6    | 6    | 6    | 6    | 6    | 6    | 6     | 6  | 6  | 6  |

NOTES:

- EC: Electrical Conductivity
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- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY
- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.91

OVERBURDEN ANALYSIS DATA FOR SHOB-138R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture                      |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|------------------------------|
| 0                         | 2510.4                         | 2.5                          | 2507.9                            | 2.2             | 0.31          | 0.56              | 7.5       | 1.3            | 1.13 | 92.8                      | 60               | 25               | 15               | Sandy Loam                   |
| 2.5                       | 2507.9                         | 5                            | 2505.4                            | 1.5             | 0.22          | 0.35              | 7.7       | 0.89           | 0.93 | 52.6                      | 76               | 3                | 21               | Sandy Clay Loam              |
| 5                         | 2505.4                         | 7.5                          | 2502.9                            | 0.98            | 0.78          | 0.34              | 8.3       | 7.5            | 9.28 | 84.4                      | 44               | 32               | 24               | Loam                         |
| 7.5                       | 2502.9                         | 10                           | 2500.4                            | 0.67            | 1.28          | 0.31              | 9.1       | 12             | 17.8 | 94.7                      | 23               | 49               | 28               | Clay Loam                    |
| 10                        | 2500.4                         | 12.5                         | 2497.9                            | 0.52            | 1.37          | 0.31              | 9         | 13             | 21   | 111                       | 25               | 55               | 20               | Silt Loam                    |
| 12.5                      | 2497.9                         | 15                           | 2495.4                            | 1.3             | 1.16          | 0.64              | 7.8       | 10             | 10.6 | 67.5                      | 67               | 15               | 18               | Sandy Loam                   |
| 15                        | 2495.4                         | 17.5                         | 2492.9                            | 1.2             | 0.83          | 0.47              | 7.8       | 7.3            | 7.99 | 66.9                      | 69               | 16               | 15               | Sandy Loam                   |
| 17.5                      | 2492.9                         | 20                           | 2490.4                            | 1.3             | 1.04          | 0.64              | 7.8       | 9.1            | 9.25 | 53.1                      | 63               | 17               | 20               | Sandy Loam - Sandy Clay Loam |
| 20                        | 2490.4                         | 25                           | 2485.4                            | 2               | 1.38          | 1.1               | 7.6       | 12             | 9.58 | 43.9                      | 71               | 13               | 16               | Sandy Loam                   |
| 25                        | 2485.4                         | 30                           | 2480.4                            | 1.7             | 1.29          | 0.88              | 7.6       | 11             | 9.83 | 44                        | 68               | 14               | 18               | Sandy Loam                   |
| 30                        | 2480.4                         | 35                           | 2475.4                            | 2               | 1.37          | 1.1               | 7.4       | 12             | 9.66 | 43.4                      | 71               | 15               | 14               | Sandy Loam                   |
| 35                        | 2475.4                         | 40                           | 2470.4                            | 1.7             | 1.28          | 0.87              | 7.4       | 12             | 10.3 | 51.6                      | 69               | 11               | 20               | Sandy Loam - Sandy Clay Loam |
| 40                        | 2470.4                         | 45                           | 2465.4                            | 1.1             | 1.45          | 0.64              | 7.3       | 15             | 15.5 | 121                       | 71               | 11               | 18               | Sandy Loam                   |
| 45                        | 2465.4                         | 50                           | 2460.4                            | 0.47            | 1.09          | 0.43              | 8.4       | 12             | 17.5 | 169                       | 59               | 21               | 20               | Sandy Loam - Sandy Clay Loam |
| 50                        | 2460.4                         | 55                           | 2455.4                            | 0.49            | 1.21          | 0.53              | 8.9       | 13             | 18.5 | 169                       | 49               | 27               | 24               | Sandy Clay Loam              |
| 55                        | 2455.4                         | 60                           | 2450.4                            | 0.44            | 1.21          | 0.43              | 9.1       | 13             | 19.8 | 144                       | 53               | 25               | 22               | Sandy Clay Loam              |
| 60                        | 2450.4                         | 65                           | 2445.4                            | 0.47            | 1.17          | 0.41              | 8.9       | 13             | 19.3 | 127                       | 79               | 7                | 14               | Sandy Loam                   |
| 65                        | 2445.4                         | 70                           | 2440.4                            | 0.47            | 1.12          | 0.46              | 9         | 12             | 17.7 | 134                       | 77               | 9                | 14               | Sandy Loam                   |
| 70                        | 2440.4                         | 75                           | 2435.4                            | 0.25            | 0.94          | 0.43              | 9.2       | 10             | 17.9 | 141                       | 69               | 15               | 16               | Sandy Loam                   |
| 75                        | 2435.4                         | 80                           | 2430.4                            | 0.34            | 1.32          | 0.3               | 9.3       | 14             | 24.7 | 113                       | 71               | 16               | 13               | Sandy Loam                   |
| 80                        | 2430.4                         | 85                           | 2425.4                            | 0.4             | 1.12          | 0.32              | 9.3       | 12             | 20   | 129                       | 75               | 15               | 10               | Sandy Loam                   |
| 85                        | 2425.4                         | 90                           | 2420.4                            | 0.3             | 1.3           | 0.3               | 9.4       | 14             | 25.5 | 101                       | 80               | 8                | 12               | Sandy Loam                   |
| 90                        | 2420.4                         | 95                           | 2415.4                            | 0.24            | 1.11          | 0.22              | 9.5       | 12             | 25   | 119                       | 79               | 11               | 10               | Sandy Loam                   |
| 95                        | 2415.4                         | 100                          | 2410.4                            | 0.23            | 1.33          | 0.28              | 9.4       | 13             | 26.4 | 103                       | 79               | 10               | 11               | Sandy Loam                   |
| 100                       | 2410.4                         | 105                          | 2405.4                            | 0.42            | 1.74          | 0.28              | 9.1       | 17             | 29.5 | 114                       | 75               | 12               | 13               | Sandy Loam                   |
| 105                       | 2405.4                         | 110                          | 2400.4                            | 0.32            | 1.84          | 0.37              | 9.1       | 19             | 32   | 140                       | 34               | 31               | 35               | Clay Loam                    |
| 110                       | 2400.4                         | 115                          | 2395.4                            | 0.31            | 1.94          | 0.33              | 9.3       | 20             | 36   | 156                       | 34               | 28               | 38               | Clay Loam                    |
| 115                       | 2395.4                         | 120                          | 2390.4                            | 0.36            | 1.23          | 0.42              | 9.7       | 13             | 20.2 | 213                       | 44               | 27               | 29               | Clay Loam                    |

Statistical Summary

|         |      |      |      |      |       |       |        |    |    |    |
|---------|------|------|------|------|-------|-------|--------|----|----|----|
| Min     | 0.23 | 0.22 | 0.22 | 7.3  | 0.89  | 0.93  | 43.4   | 23 | 3  | 10 |
| Average | 0.85 | 1.19 | 0.49 | 8.57 | 11.79 | 17.24 | 107.10 | 62 | 19 | 19 |
| Max     | 2.2  | 1.94 | 1.1  | 9.7  | 20    | 36    | 213    | 80 | 55 | 38 |
| Number  | 28   | 28   | 28   | 28   | 28    | 28    | 28     | 28 | 28 | 28 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.92

OVERBURDEN ANALYSIS DATA FOR SHOB-139R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture          |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|------------------|
| 0                         | 2514.2                         | 2.5                          | 2511.7                            | 1.1             | 0.58          | 0.67              | 8         | 4.7            | 5    | 151                       | 85               | 8                | 7                | Loamy Sand       |
| 2.5                       | 2511.7                         | 5.0                          | 2509.2                            | 1.1             | 0.71          | 0.45              | 8.2       | 4.6            | 5.14 | 91.1                      | 85               | 5                | 10               | Loamy Sand       |
| 5                         | 2509.2                         | 7.5                          | 2506.7                            | 1.6             | 0.53          | 0.69              | 8         | 3              | 2.75 | 83.1                      | 73               | 20               | 7                | Sandy Loam       |
| 7.5                       | 2506.7                         | 10.0                         | 2504.2                            | 1.5             | 1.3           | 0.66              | 8.4       | 11             | 10.2 | 67.3                      | 79               | 6                | 15               | Sandy Loam       |
| 10                        | 2504.2                         | 12.5                         | 2501.7                            | 0.3             | 0.74          | 0.15              | 8.9       | 6.7            | 14.2 | 105                       | 89               | 3                | 8                | Loamy Sand       |
| 12.5                      | 2501.7                         | 15.0                         | 2499.2                            |                 |               |                   |           |                |      |                           | 83               | 10               | 7                | Loamy Sand       |
| 15                        | 2499.2                         | 17.5                         | 2496.7                            | 4               | 0.84          | 1.9               | 8.1       | 36             | 20.9 | 40.2                      | 63               | 28               | 9                | Sandy Loam       |
| 17.5                      | 2496.7                         | 20.0                         | 2494.2                            | 0.98            | 0.79          | 0.33              | 7.8       | 7.9            | 9.82 | 105                       | 38               | 41               | 21               | Loam             |
| 20                        | 2494.2                         | 25.0                         | 2489.2                            | 1.1             | 0.96          | 0.61              | 8.2       | 8.1            | 8.87 | 120                       | 25               | 37               | 38               | Clay Loam        |
| 25                        | 2489.2                         | 30.0                         | 2484.2                            | 0.87            | 1.02          | 0.53              | 8.5       | 9.8            | 11.8 | 130                       | 26               | 34               | 40               | Clay - Clay Loam |
| 30                        | 2484.2                         | 35.0                         | 2479.2                            | 0.47            | 0.94          | 0.27              | 8.8       | 8.4            | 13.9 | 114                       | 40               | 17               | 43               | Clay             |
| 35                        | 2479.2                         | 40.0                         | 2474.2                            | 0.98            | 0.61          | 0.51              | 9.2       | 5.7            | 6.56 | 127                       | 49               | 15               | 36               | Sandy Clay       |
| 40                        | 2474.2                         | 45.0                         | 2469.2                            | 1.8             | 0.52          | 0.89              | 9.3       | 4.9            | 4.26 | 145                       | 50               | 17               | 33               | Sandy Clay Loam  |
| 45                        | 2469.2                         | 50.0                         | 2464.2                            | 0.89            | 0.6           | 0.9               | 8.6       | 8.2            | 8.69 | 114                       | 49               | 17               | 34               | Sandy Clay Loam  |
| 50                        | 2464.2                         | 55.0                         | 2459.2                            | 0.9             | 0.8           | 0.98              | 7.9       | 7.6            | 7.9  | 89.6                      | 47               | 23               | 30               | Sandy Clay Loam  |
| 55                        | 2459.2                         | 60.0                         | 2454.2                            | 1.7             | 0.98          | 0.86              | 8.8       | 9.6            | 8.57 | 137                       | 26               | 40               | 34               | Clay Loam        |
| 60                        | 2454.2                         | 65.0                         | 2449.2                            | 0.62            | 1.19          | 0.43              | 9.1       | 12             | 16.3 | 145                       | 9                | 58               | 33               | Silty Clay Loam  |
| 65                        | 2449.2                         | 70.0                         | 2444.2                            | 0.42            | 1.84          | 0.49              | 8.9       | 18             | 26.8 | 150                       | 20               | 36               | 44               | Clay             |
| 70                        | 2444.2                         | 75.0                         | 2439.2                            | 0.48            | 1.64          | 0.48              | 9.3       | 16             | 23   | 140                       | 24               | 26               | 50               | Clay             |
| 75                        | 2439.2                         | 80.0                         | 2434.2                            | 0.52            | 1.23          | 0.29              | 9.3       | 12             | 18.5 | 120                       | 29               | 39               | 32               | Clay Loam        |

Statistical Summary

|         |      |      |      |      |       |       |        |    |    |    |
|---------|------|------|------|------|-------|-------|--------|----|----|----|
| Min     | 0.3  | 0.52 | 0.15 | 7.8  | 3     | 2.75  | 40.2   | 9  | 3  | 7  |
| Average | 1.12 | 0.94 | 0.64 | 8.59 | 10.22 | 11.75 | 114.44 | 49 | 24 | 27 |
| Max     | 4    | 1.84 | 1.9  | 9.3  | 36    | 26.8  | 151    | 89 | 58 | 50 |
| Number  | 19   | 19   | 19   | 19   | 19    | 19    | 19     | 20 | 20 | 20 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-140R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture    |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|------------|
| 0                         | 2520.2                         | 2.5                          | 2517.7                            |                 |               |                   |           |                |      |                           | 29               | 43               | 28               | Clay Loam  |
| 2.5                       | 2517.7                         | 5                            | 2515.2                            |                 |               |                   |           |                |      |                           | 61               | 27               | 12               | Sandy Loam |
| 5                         | 2515.2                         | 7.5                          | 2512.7                            | 12              | 7.89          | 2.8               | 8.6       | 77             | 28.9 | 173                       | 20               | 56               | 24               | Silt Loam  |
| 7.5                       | 2512.7                         | 10                           | 2510.2                            | 12              | 6.1           | 2.1               | 8.5       | 56             | 21.1 | 229                       | 23               | 45               | 32               | Clay Loam  |
| 10                        | 2510.2                         | 12.5                         | 2507.7                            | 5.3             | 4.8           | 0.89              | 8.4       | 45             | 25.5 | 240                       | 25               | 43               | 32               | Clay Loam  |
| 12.5                      | 2507.7                         | 15                           | 2505.2                            |                 |               |                   |           |                |      |                           | 30               | 49               | 21               | Loam       |
| 15                        | 2505.2                         | 17.5                         | 2502.7                            |                 |               |                   |           |                |      |                           | 21               | 46               | 33               | Clay Loam  |
| 17.5                      | 2502.7                         | 20                           | 2500.2                            |                 |               |                   |           |                |      |                           | 17               | 71               | 12               | Silt Loam  |
| 20                        | 2500.2                         | 25                           | 2495.2                            | 0.44            | 0.64          | 0.17              | 9         | 6.1            | 11.1 | 126                       | 77               | 18               | 5                | Loamy Sand |
| 25                        | 2495.2                         | 30                           | 2490.2                            | 0.58            | 0.56          | 0.24              | 9         | 5.6            | 8.81 | 177                       | 64               | 19               | 17               | Sandy Loam |
| 30                        | 2490.2                         | 35                           | 2485.2                            | 0.91            | 0.69          | 0.38              | 9         | 7.2            | 8.91 | 178                       | 59               | 24               | 17               | Sandy Loam |
| 35                        | 2485.2                         | 40                           | 2480.2                            | 0.82            | 0.91          | 0.47              | 8.1       | 9.8            | 12.2 | 173                       | 55               | 30               | 15               | Sandy Loam |
| 40                        | 2480.2                         | 45                           | 2475.2                            | 0.58            | 0.68          | 0.24              | 8.6       | 6.8            | 10.7 | 145                       | 80               | 13               | 7                | Loamy Sand |
| 45                        | 2475.2                         | 50                           | 2470.2                            | 0.62            | 1.07          | 0.33              | 8.3       | 10             | 15.2 | 120                       | 68               | 21               | 11               | Sandy Loam |
| 50                        | 2470.2                         | 55                           | 2465.2                            | 0.4             | 0.94          | 0.24              | 8.7       | 9.2            | 16.3 | 114                       | 65               | 22               | 13               | Sandy Loam |
| 55                        | 2465.2                         | 60                           | 2460.2                            | 0.46            | 0.81          | 0.24              | 8.7       | 8.4            | 14.2 | 134                       | 65               | 24               | 11               | Sandy Loam |
| 60                        | 2460.2                         | 65                           | 2455.2                            | 0.49            | 0.74          | 0.22              | 8.8       | 7.3            | 12.2 | 143                       | 71               | 14               | 15               | Sandy Loam |
| 65                        | 2455.2                         | 70                           | 2450.2                            | 0.44            | 0.72          | 0.2               | 8.9       | 7.2            | 12.8 | 154                       | 73               | 14               | 13               | Sandy Loam |
| 70                        | 2450.2                         | 75                           | 2445.2                            | 0.45            | 0.84          | 0.24              | 9         | 8.8            | 15.1 | 128                       | 65               | 19               | 16               | Sandy Loam |
| 75                        | 2445.2                         | 80                           | 2440.2                            | 0.29            | 0.7           | 0.34              | 9.2       | 7.5            | 13.4 | 167                       | 68               | 19               | 13               | Sandy Loam |

Statistical Summary

|         |      |      |      |      |       |       |        |    |    |    |
|---------|------|------|------|------|-------|-------|--------|----|----|----|
| Min     | 0.29 | 0.56 | 0.17 | 8.1  | 5.6   | 8.81  | 114    | 17 | 13 | 5  |
| Average | 2.39 | 1.87 | 0.61 | 8.72 | 18.13 | 15.09 | 160.07 | 52 | 31 | 17 |
| Max     | 12   | 7.89 | 2.8  | 9.2  | 77    | 28.9  | 240    | 80 | 71 | 33 |
| Number  | 15   | 15   | 15   | 15   | 15    | 15    | 15     | 20 | 20 | 20 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-141R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture                     |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------------------|
| 0                         | 2558.4                         | 2.5                          | 2555.9                            | 1.6             | 0.37          | 1.5               | 8.2       | 1              | 0.81 | 183                       | 11               | 64               | 25               | Silt Loam                   |
| 2.5                       | 2555.9                         | 5                            | 2553.4                            | 19              | 4.61          | 27                | 8         | 19             | 4.07 | 154                       | 5                | 62               | 33               | Silty Clay Loam             |
| 5                         | 2553.4                         | 7.5                          | 2550.9                            | 6               | 3.69          | 17                | 8.4       | 21             | 6.2  | 155                       | 3                | 60               | 37               | Silty Clay Loam             |
| 7.5                       | 2550.9                         | 10                           | 2548.4                            | 12              | 4.89          | 27                | 8.2       | 25             | 5.76 | 154                       | 6                | 63               | 31               | Silty Clay Loam             |
| 10                        | 2548.4                         | 12.5                         | 2545.9                            | 27              | 7.08          | 44                | 5.6       | 38             | 6.38 | 156                       | 32               | 49               | 19               | Loam                        |
| 12.5                      | 2545.9                         | 15                           | 2543.4                            | 18              | 6.9           | 39                | 4.1       | 41             | 7.67 | 172                       | 34               | 35               | 31               | Clay Loam                   |
| 15                        | 2543.4                         | 17.5                         | 2540.9                            | 21              | 4.72          | 25                | 5         | 20             | 4.11 | 155                       | 9                | 50               | 41               | Silty Clay                  |
| 17.5                      | 2540.9                         | 20                           | 2538.4                            | 24              | 4.79          | 24                | 6.4       | 18             | 3.65 | 174                       | 9                | 44               | 47               | Silty Clay                  |
| 20                        | 2538.4                         | 25                           | 2533.4                            | 8.3             | 3.68          | 15                | 7.1       | 20             | 5.98 | 135                       | 11               | 52               | 37               | Silty Clay Loam             |
| 25                        | 2533.4                         | 30                           | 2528.4                            | 9.9             | 3.62          | 14                | 7.4       | 20             | 5.82 | 156                       | 19               | 42               | 39               | Silty Clay Loam             |
| 30                        | 2528.4                         | 35                           | 2523.4                            | 1.8             | 1.84          | 3.1               | 8         | 13             | 8.27 | 268                       | 1                | 30               | 69               | Clay                        |
| 35                        | 2523.4                         | 40                           | 2518.4                            | 16              | 5.86          | 23                | 6.4       | 38             | 8.69 | 197                       | 47               | 22               | 31               | Sandy Clay Loam             |
| 40                        | 2518.4                         | 45                           | 2513.4                            | 2.8             | 3.22          | 4.7               | 8.1       | 25             | 13.2 | 139                       | 60               | 17               | 23               | Sandy Clay Loam             |
| 45                        | 2513.4                         | 50                           | 2508.4                            | 1.9             | 3.27          | 2.6               | 8.8       | 29             | 19.2 | 130                       | 19               | 56               | 25               | Silt Loam                   |
| 50                        | 2508.4                         | 55                           | 2503.4                            | 0.71            | 2.09          | 0.73              | 8.9       | 19             | 22.4 | 195                       | 12               | 55               | 33               | Silty Clay Loam             |
| 55                        | 2503.4                         | 60                           | 2498.4                            | 1.4             | 2.66          | 1.3               | 9.5       | 25             | 21.6 | 183                       | 13               | 58               | 29               | Silty Clay Loam             |
| 60                        | 2498.4                         | 65                           | 2493.4                            | 0.25            | 1.12          | 0.21              | 9.5       | 11             | 23.2 | 260                       | 1                | 60               | 39               | Silty Clay Loam             |
| 65                        | 2493.4                         | 70                           | 2488.4                            | 0.18            | 0.64          | 0.67              | 9.7       | 7              | 10.9 | 634                       | 16               | 61               | 23               | Silt Loam                   |
| 70                        | 2488.4                         | 75                           | 2483.4                            | 0.29            | 1.01          | 0.31              | 9.4       | 11             | 19.8 | 410                       | 48               | 33               | 19               | Loam                        |
| 75                        | 2483.4                         | 80                           | 2478.4                            | 0.55            | 1.3           | 0.45              | 9.2       | 14             | 19.7 | 231                       | 59               | 24               | 17               | Sandy Loam                  |
| 80                        | 2478.4                         | 85                           | 2473.4                            | 0.76            | 1.19          | 0.81              | 7.3       | 56             | 63.7 | 106                       | 51               | 30               | 19               | Loam                        |
| 95                        | 2463.4                         | 100                          | 2458.4                            | 2.6             | 4.4           | 3.2               | 7         | 41             | 24.3 | 97.5                      | 15               | 44               | 41               | Silty Clay                  |
| 100                       | 2458.4                         | 105                          | 2453.4                            | 3.4             | 8.76          | 3                 | 8.1       | 33             | 18.4 | 99.9                      | 10               | 63               | 27               | Silty Clay Loam - Silt Loam |
| 105                       | 2453.4                         | 110                          | 2448.4                            | 1.8             | 7.67          | 1                 | 9         | 19             | 16.1 | 115                       | 9                | 58               | 33               | Silty Clay Loam             |

Statistical Summary

|         |      |      |       |      |       |       |        |    |    |    |
|---------|------|------|-------|------|-------|-------|--------|----|----|----|
| Min     | 0.18 | 0.37 | 0.21  | 4.1  | 1     | 0.81  | 97.5   | 1  | 17 | 17 |
| Average | 7.55 | 3.72 | 11.61 | 7.80 | 23.50 | 14.16 | 194.14 | 21 | 47 | 32 |
| Max     | 27   | 8.76 | 44    | 9.7  | 56    | 63.7  | 634    | 60 | 64 | 69 |
| Number  | 24   | 24   | 24    | 24   | 24    | 24    | 24     | 24 | 24 | 24 |

Depth to Coal: 85'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |        |    |    |    |
|---------|------|------|-------|------|-------|-------|--------|----|----|----|
| Min     | 0.18 | 0.37 | 0.21  | 4.1  | 1     | 0.81  | 106    | 1  | 17 | 17 |
| Average | 8.26 | 3.26 | 12.92 | 7.77 | 22.43 | 13.39 | 207.00 | 22 | 46 | 32 |
| Max     | 27   | 7.08 | 44    | 9.7  | 56    | 63.7  | 634    | 60 | 64 | 69 |
| Number  | 21   | 21   | 21    | 21   | 21    | 21    | 21     | 21 | 21 | 21 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite



APPENDIX 2.3-6.95

OVERBURDEN ANALYSIS DATA FOR SHOB-142R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2519.1                         | 2.5                          | 2516.6                            | 3.5             | 0.86          | 0.6               | 7.7       | 6              | 4.2  | 58                        |                  |                  |                  |                 |
| 2.5                       | 2516.6                         | 5                            | 2514.1                            | 1.6             | 1.1           | 0.4               | 8.3       | 11.6           | 11.8 | 52                        | 12               | 73               | 15               | Silt Loam       |
| 5                         | 2514.1                         | 7.5                          | 2511.6                            | 1.4             | 1.5           | 0.3               | 8.1       | 16             | 17   | 81                        | 6                | 64               | 30               | Silty Clay Loam |
| 7.5                       | 2511.6                         | 10                           | 2509.1                            | 10.6            | 6.1           | 1.7               | 8.1       | 62.2           | 25.1 | 88                        | 16               | 46               | 38               | Silty Clay Loam |
| 10                        | 2509.1                         | 12.5                         | 2506.6                            | 12              | 5.9           | 2.2               | 8.1       | 59.4           | 22.3 | 89                        |                  |                  |                  |                 |
| 12.5                      | 2506.6                         | 15                           | 2504.1                            | 12.3            | 6             | 2.1               | 8.1       | 60.4           | 22.5 | 92                        | 18               | 45               | 37               | Silty Clay Loam |
| 15                        | 2504.1                         | 17.5                         | 2501.6                            | 4.7             | 4.8           | 1.2               | 8.2       | 49.2           | 28.6 | 88                        |                  |                  |                  |                 |
| 17.5                      | 2501.6                         | 20                           | 2499.1                            | 1               | 2.8           | 0.5               | 8.4       | 27.5           | 31.2 | 57                        | 50               | 31               | 19               | Loam            |
| 20                        | 2499.1                         | 25                           | 2494.1                            | 0.8             | 2.4           | 0.5               | 8.1       | 22.8           | 29   | 64                        | 40               | 35               | 25               | Loam            |
| 25                        | 2494.1                         | 30                           | 2489.1                            | 1.2             | 2.5           | 0.5               | 8.2       | 24             | 25.9 | 37                        | 62               | 22               | 16               | Sandy Loam      |
| 30                        | 2489.1                         | 35                           | 2484.1                            | 0.5             | 1.5           | 0.3               | 8.4       | 15.7           | 24.8 | 45                        | 50               | 31               | 19               | Loam            |
| 35                        | 2484.1                         | 40                           | 2479.1                            | 0.4             | 1.2           | 0.1               | 8.4       | 11.8           | 22.1 | 52                        | 64               | 13               | 23               | Sandy Clay Loam |
| 40                        | 2479.1                         | 45                           | 2474.1                            | 0.4             | 1.2           | 0.2               | 8.4       | 12.8           | 23.7 | 47                        | 58               | 21               | 21               | Sandy Clay Loam |
| 45                        | 2474.1                         | 50                           | 2469.1                            | 1.2             | 2.3           | 0.6               | 8.3       | 23.9           | 25.1 | 29                        | 75               | 14               | 11               | Sandy Loam      |
| 50                        | 2469.1                         | 55                           | 2464.1                            | 0.6             | 1.4           | 0.3               | 8         | 15.6           | 23.4 | 65                        | 44               | 31               | 25               | Loam            |
| 55                        | 2464.1                         | 60                           | 2459.1                            | 0.4             | 1.2           | 0.2               | 8.4       | 12.6           | 22.5 | 120                       | 17               | 44               | 39               | Silty Clay Loam |
| 65                        | 2454.1                         | 70                           | 2449.1                            | 0.4             | 1.5           | 0.2               | 8.5       | 16             | 29.8 | 150                       | 1                | 49               | 50               | Silty Clay      |
| 70                        | 2449.1                         | 75                           | 2444.1                            | 0.2             | 1.4           | 0.2               | 8.7       | 15.8           | 35.5 | 150                       | 1                | 50               | 50               | Silty Clay      |
| 75                        | 2444.1                         | 80                           | 2439.1                            | 0.2             | 1.7           | 0.2               | 8.8       | 17.7           | 39   | 94                        | 19               | 51               | 30               | Silty Clay Loam |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.2  | 0.86 | 0.1  | 7.7  | 6     | 4.2   | 29    | 1  | 13 | 11 |
| Average | 2.81 | 2.49 | 0.65 | 8.27 | 25.32 | 24.39 | 76.74 | 33 | 39 | 28 |
| Max     | 12.3 | 6.1  | 2.2  | 8.8  | 62.2  | 39    | 150   | 75 | 73 | 50 |
| Number  | 19   | 19   | 19   | 19   | 19    | 19    | 19    | 16 | 16 | 16 |

Depth to Coal: NA

Statistical Summary Above Coal

|         |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|
| Min     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Average | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Max     | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Number  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.96

OVERBURDEN ANALYSIS DATA FOR SHOB-143R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2563.4                         | 2.5                          | 2560.9                            | 1.8             | 0.53          | 2.4               | 8         | 1.3            | 0.93 | 70                        |                  |                  |                  |                 |
| 2.5                       | 2560.9                         | 5                            | 2558.4                            | 15.1            | 2.7           | 15.4              | 7.8       | 6.2            | 1.6  | 79                        | 9                | 47               | 44               | Silty Clay      |
| 5                         | 2558.4                         | 7.5                          | 2555.9                            | 22.9            | 5.3           | 31.1              | 7.9       | 26.4           | 5.07 | 69                        | 12               | 53               | 35               | Silty Clay Loam |
| 7.5                       | 2555.9                         | 10                           | 2553.4                            | 21.7            | 7.8           | 41.6              | 7.7       | 64.4           | 11.4 | 79                        | 10               | 58               | 32               | Silty Clay Loam |
| 10                        | 2553.4                         | 12.5                         | 2550.9                            | 23.6            | 14            | 106               | 4.4       | 141            | 17.4 | 67                        | 18               | 45               | 37               | Silty Clay Loam |
| 12.5                      | 2550.9                         | 15                           | 2548.4                            | 24.2            | 12            | 70.6              | 4         | 123            | 17.8 | 83                        | 44               | 31               | 25               | Loam            |
| 15                        | 2548.4                         | 17.5                         | 2545.9                            | 23.8            | 7.5           | 41.1              | 6.8       | 54.6           | 9.59 | 55                        |                  |                  |                  |                 |
| 17.5                      | 2545.9                         | 20                           | 2543.4                            | 6.2             | 4.5           | 10.2              | 7.9       | 34.3           | 12   | 76                        | 2                | 67               | 31               | Silty Clay Loam |
| 20                        | 2543.4                         | 25                           | 2538.4                            | 1.1             | 2.4           | 1.8               | 8.1       | 20.5           | 17.3 | 140                       | 3                | 66               | 31               | Silty Clay Loam |
| 25                        | 2538.4                         | 30                           | 2533.4                            | 2.3             | 3.6           | 3.9               | 8.3       | 31             | 17.7 | 150                       | 6                | 61               | 33               | Silty Clay Loam |
| 30                        | 2533.4                         | 35                           | 2528.4                            | 1.6             | 3.9           | 2.6               | 8.3       | 35.5           | 24.5 | 110                       | 20               | 55               | 25               | Silt Loam       |
| 35                        | 2528.4                         | 40                           | 2523.4                            | 1.2             | 4.2           | 2.2               | 8.5       | 37.5           | 28.8 | 66                        | 64               | 19               | 17               | Sandy Loam      |
| 40                        | 2523.4                         | 45                           | 2518.4                            | 1               | 4.2           | 1.8               | 8.7       | 40.7           | 34.1 | 67                        | 62               | 22               | 16               | Sandy Loam      |
| 45                        | 2518.4                         | 50                           | 2513.4                            | 0.5             | 3             | 0.8               | 8.3       | 28.7           | 36.6 | 80                        | 56               | 28               | 16               | Sandy Loam      |
| 50                        | 2513.4                         | 55                           | 2508.4                            | 0.9             | 4.2           | 1.3               | 9.1       | 41.7           | 39.8 | 60                        | 64               | 21               | 15               | Sandy Loam      |
| 55                        | 2508.4                         | 60                           | 2503.4                            | 0.8             | 3.7           | 0.9               | 9         | 35.2           | 38.7 | 44                        |                  |                  |                  |                 |
| 60                        | 2503.4                         | 65                           | 2498.4                            | 0.5             | 2.2           | 0.6               | 8.5       | 21             | 29.1 | 82                        | 41               | 40               | 19               | Loam            |
| 80                        | 2483.4                         | 85                           | 2478.4                            | 0.1             | 1.3           | 0.1               | 8.9       | 13.3           | 38.7 | 150                       | 2                | 53               | 45               | Silty Clay      |
| 85                        | 2478.4                         | 90                           | 2473.4                            | 0.2             | 1.5           | 0.2               | 9.1       | 16.2           | 38.5 | 140                       | 10               | 58               | 32               | Silty Clay Loam |
| 90                        | 2473.4                         | 95                           | 2468.4                            | 0.2             | 1.5           | 0.2               | 9         | 16.7           | 40.4 | 94                        | 26               | 52               | 22               | Silt Loam       |

Statistical Summary

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.1  | 0.53 | 0.1   | 4    | 1.3   | 0.93  | 44    | 2  | 19 | 15 |
| Average | 7.49 | 4.50 | 16.74 | 7.92 | 39.46 | 23.00 | 88.05 | 26 | 46 | 28 |
| Max     | 24.2 | 14   | 106   | 9.1  | 141   | 40.4  | 150   | 64 | 67 | 45 |
| Number  | 20   | 20   | 20    | 20   | 20    | 20    | 20    | 17 | 17 | 17 |

Depth to Coal: 65'

Statistical Summary Above Coal

|         |      |      |       |      |       |       |       |    |    |    |
|---------|------|------|-------|------|-------|-------|-------|----|----|----|
| Min     | 0.5  | 0.53 | 0.6   | 4    | 1.3   | 0.93  | 44    | 2  | 19 | 15 |
| Average | 8.78 | 5.04 | 19.66 | 7.72 | 43.71 | 20.14 | 81.00 | 29 | 44 | 27 |
| Max     | 24.2 | 14   | 106   | 9.1  | 141   | 39.8  | 150   | 64 | 67 | 44 |
| Number  | 17   | 17   | 17    | 17   | 17    | 17    | 17    | 14 | 14 | 14 |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

OVERBURDEN ANALYSIS DATA FOR SHOB-144R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture         |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------|
| 0                         | 2527.0                         | 2.5                          | 2524.5                            | 3.3             | 3.5           | 0.81              | 7.4       | 1.4            | 0.99 | 97.7                      | 28               | 55               | 17               | Silt Loam       |
| 2.5                       | 2524.5                         | 5                            | 2522.0                            | 2               | 0.37          | 0.42              | 7.6       | 1.1            | 1.03 | 65.2                      | 31               | 60               | 9                | Silt Loam       |
| 5                         | 2522.0                         | 7.5                          | 2519.5                            | 1.8             | 2.1           | 0.32              | 8.2       | 19             | 18.1 | 99.5                      | 7                | 60               | 33               | Silty Clay Loam |
| 7.5                       | 2519.5                         | 10                           | 2517.0                            | 12              | 6.65          | 2.7               | 8.1       | 61             | 22.5 | 140                       | 5                | 58               | 37               | Silty Clay Loam |
| 10                        | 2517.0                         | 12.5                         | 2514.5                            | 3.3             | 4.93          | 0.88              | 8.4       | 45             | 31.4 | 123                       | 17               | 54               | 29               | Silty Clay Loam |
| 12.5                      | 2514.5                         | 15                           | 2512.0                            |                 |               |                   |           |                |      |                           |                  |                  |                  |                 |
| 15                        | 2512.0                         | 17.5                         | 2509.5                            | 1.1             | 1.23          | 0.21              | 8.7       | 9.4            | 11.8 | 253                       | 19               | 51               | 30               | Silty Clay Loam |
| 17.5                      | 2509.5                         | 20                           | 2507.0                            | 21              | 5.25          | 6.6               | 7.6       | 36             | 9.79 | 157                       | 26               | 41               | 33               | Clay Loam       |
| 20                        | 2507.0                         | 25                           | 2502.0                            | 4               | 2.6           | 1.9               | 8         | 19             | 11   | 67.6                      | 46               | 35               | 19               | Loam            |
| 25                        | 2502.0                         | 30                           | 2497.0                            | 1.1             | 1.36          | 0.68              | 8.2       | 11             | 11.9 | 78.9                      | 23               | 42               | 35               | Clay Loam       |
| 30                        | 2497.0                         | 35                           | 2492.0                            | 0.54            | 0.77          | 0.3               | 8.4       | 6.6            | 10.2 | 96.9                      | 21               | 41               | 38               | Clay Loam       |
| 35                        | 2492.0                         | 40                           | 2487.0                            | 22              | 4.95          | 9.6               | 7.5       | 31             | 7.89 | 110                       | 62               | 21               | 17               | Sandy Loam      |
| 40                        | 2487.0                         | 45                           | 2482.0                            | 14              | 4             | 6                 | 7.6       | 25             | 8.04 | 61                        | 72               | 15               | 13               | Sandy Loam      |
| 45                        | 2482.0                         | 50                           | 2477.0                            | 21              | 5.33          | 9.4               | 7.5       | 32             | 8.27 | 77.3                      | 70               | 15               | 15               | Sandy Loam      |
| 50                        | 2477.0                         | 55                           | 2472.0                            | 1.5             | 1.92          | 0.64              | 8.4       | 9.1            | 8.72 | 44.1                      | 69               | 15               | 16               | Sandy Loam      |
| 55                        | 2472.0                         | 60                           | 2467.0                            | 0.63            | 0.98          | 0.36              | 8.6       | 8.8            | 12.6 | 48.3                      | 68               | 18               | 14               | Sandy Loam      |
| 60                        | 2467.0                         | 65                           | 2462.0                            | 1.4             | 1.81          | 0.8               | 8.1       | 15             | 14.3 | 48.2                      | 72               | 15               | 13               | Sandy Loam      |
| 65                        | 2462.0                         | 70                           | 2457.0                            | 0.67            | 1.32          | 0.4               | 8         | 12             | 16.3 | 46                        | 68               | 17               | 15               | Sandy Loam      |
| 70                        | 2457.0                         | 75                           | 2452.0                            | 0.76            | 1.28          | 0.45              | 8.4       | 12             | 15   | 66.6                      | 65               | 22               | 13               | Sandy Loam      |
| 75                        | 2452.0                         | 80                           | 2447.0                            | 0.96            | 1.62          | 0.62              | 7.9       | 14             | 16.2 | 50.4                      | 62               | 22               | 16               | Sandy Loam      |
| 80                        | 2447.0                         | 85                           | 2442.0                            | 1.3             | 1.93          | 0.72              | 8.1       | 17             | 16.5 | 63                        | 58               | 25               | 17               | Sandy Loam      |
| 85                        | 2442.0                         | 90                           | 2437.0                            | 1.1             | 1.75          | 0.56              | 8.2       | 15             | 17   | 62.6                      | 63               | 21               | 16               | Sandy Loam      |
| 90                        | 2437.0                         | 95                           | 2432.0                            | 1.2             | 1.81          | 0.75              | 8         | 16             | 15.8 | 56.6                      | 61               | 21               | 18               | Sandy Loam      |
| 95                        | 2432.0                         | 100                          | 2427.0                            | 1.2             | 1.76          | 0.74              | 8.1       | 15             | 15.6 | 46.8                      | 59               | 22               | 19               | Sandy Loam      |

Statistical Summary

|         |      |      |      |      |       |       |       |    |    |    |
|---------|------|------|------|------|-------|-------|-------|----|----|----|
| Min     | 0.54 | 0.37 | 0.21 | 7.4  | 1.1   | 0.99  | 44.1  | 5  | 15 | 9  |
| Average | 5.12 | 2.57 | 1.99 | 8.04 | 18.76 | 13.08 | 85.20 | 47 | 32 | 21 |
| Max     | 22   | 6.65 | 9.6  | 8.7  | 61    | 31.4  | 253   | 72 | 60 | 38 |
| Number  | 23   | 23   | 23   | 23   | 23    | 23    | 23    | 23 | 23 | 23 |

Depth to Coal: N<sub>2</sub> 58' \*

Statistical Summary Above Coal

|         |      |      |      |      |       |       |        |       |       |       |
|---------|------|------|------|------|-------|-------|--------|-------|-------|-------|
| Min     | 0.54 | 0.37 | 0.21 | 7.4  | 1.1   | 0.99  | 44.1   | 5     | 15    | 9     |
| Average | 7.28 | 3.06 | 2.72 | 8.01 | 21.03 | 11.62 | 101.30 | 37.60 | 38.73 | 23.67 |
| Max     | 22   | 6.65 | 9.6  | 8.7  | 61    | 31.4  | 253    | 72    | 60    | 38    |
| Number  | 15   | 15   | 15   | 15   | 15    | 15    | 15     | 15    | 15    | 15    |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Energy Laboratories of Casper, WY

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.98

OVERBURDEN ANALYSIS DATA FOR SHOB-201R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture                     |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|-----------------------------|
| 0                         | 2621.8                         | 5                            | 2616.8                            | 1.0             | 0.27          | 0.58              | 7.40      | 0.75           | 0.84 | 36.9                      | 81.3             | 6.2              | 12.5             | Sandy Loam                  |
| 5                         | 2616.8                         | 10                           | 2611.8                            | 1.7             | 0.46          | 0.97              | 8.20      | 1.3            | 1.1  | 43.5                      | 80               | 10               | 10               | Sandy Loam/Loamy Sand       |
| 10                        | 2611.8                         | 15                           | 2606.8                            | 1.3             | 0.40          | 0.76              | 8.30      | 1.7            | 1.6  | 40.6                      | 85               | 5                | 10               | Loamy Sand                  |
| 15                        | 2606.8                         | 20                           | 2601.8                            | 1.3             | 0.43          | 0.76              | 8.30      | 1.7            | 1.7  | 44.0                      | 81.3             | 7.4              | 11.3             | Loamy Sand                  |
| 20                        | 2601.8                         | 25                           | 2596.8                            | 1.0             | 0.39          | 0.60              | 8.20      | 1.9            | 2.1  | 44.0                      | 81.3             | 4.9              | 13.8             | Sandy Loam                  |
| 25                        | 2596.8                         | 30                           | 2591.8                            | 2.0             | 0.57          | 1.3               | 8.40      | 2.4            | 1.9  | 46.2                      | 82.5             | 7.5              | 10               | Loamy Sand                  |
| 30                        | 2591.8                         | 35                           | 2586.8                            | 2.4             | 1.2           | 2.5               | 8.10      | 6.6            | 4.2  | 90.2                      | 46.3             | 28.7             | 25               | Loam                        |
| 35                        | 2586.8                         | 40                           | 2581.8                            | 1.3             | 0.97          | 1.0               | 8.60      | 6.5            | 6.0  | 132                       | 25               | 32.5             | 42.5             | Clay                        |
| 40                        | 2581.8                         | 45                           | 2576.8                            | 1.4             | 1.3           | 1.4               | 8.60      | 8.5            | 7.2  | 165                       | 21.3             | 33.2             | 45               | Clay                        |
| 45                        | 2576.8                         | 50                           | 2571.8                            | 1.2             | 1.3           | 1.3               | 8.60      | 8.7            | 7.8  | 179                       | 26.3             | 28.7             | 45               | Clay                        |
| 50                        | 2571.8                         | 55                           | 2566.8                            | 0.89            | 1.0           | 0.92              | 8.90      | 11.5           | 12.1 | 170                       | 30               | 31.2             | 38.8             | Clay Loam                   |
| 55                        | 2566.8                         | 60                           | 2561.8                            | 0.90            | 5.9           | 0.85              | 9.10      | 12.1           | 13   | 183                       | 27.5             | 28.7             | 43.8             | Clay                        |
| 65                        | 2556.8                         | 70                           | 2551.8                            | 0.98            | 1.2           | 0.88              | 8.60      | 14.9           | 15.4 | 201                       | 40               | 16.2             | 43.8             | Clay                        |
| 70                        | 2551.8                         | 75                           | 2546.8                            | 0.60            | 6.2           | 0.38              | 9.00      | 9.6            | 13.8 | 246                       | 20               | 28.7             | 51.3             | Clay                        |
| 75                        | 2546.8                         | 80                           | 2541.8                            | 0.83            | 1.5           | 0.54              | 8.90      | 18.9           | 22.9 | 191                       | 12.5             | 52.5             | 35               | Silty Clay Loam             |
| 80                        | 2541.8                         | 85                           | 2536.8                            | 0.79            | 1.6           | 0.67              | 8.90      | 20.8           | 24.3 | 194                       | 20               | 43.7             | 36.3             | Silty Clay Loam/Clay Loam   |
| 85                        | 2536.8                         | 90                           | 2531.8                            | 1.0             | 1.6           | 0.78              | 8.60      | 20.8           | 22   | 182                       | 43.8             | 17.4             | 38.8             | Clay Loam                   |
| 90                        | 2531.8                         | 95                           | 2526.8                            | 0.93            | 1.8           | 0.60              | 8.60      | 21.6           | 24.8 | 126                       | 16.3             | 62.4             | 21.3             | Silt Loam                   |
| 95                        | 2526.8                         | 100                          | 2521.8                            | 0.60            | 1.2           | 0.42              | 9.00      | 15.2           | 21.4 | 137                       | 31.3             | 48.7             | 20               | Loam                        |
| 100                       | 2521.8                         | 105                          | 2516.8                            | 0.30            | 1.0           | 0.20              | 9.10      | 12.4           | 24.7 | 184                       | 15               | 45               | 40               | Silty Clay Loam/ Silty Clay |
| 105                       | 2516.8                         | 110                          | 2511.8                            | 0.46            | 1.6           | 0.30              | 8.60      | 18.7           | 30.3 | 180                       | 8.8              | 47.4             | 43.8             | Silty Clay                  |
| 110                       | 2511.8                         | 115                          | 2506.8                            | 1.1             | 5.8           | 1.1               | 9.10      | 12.4           | 11.8 | 171                       | 15               | 57.5             | 27.5             | Silty Clay Loam             |
| 115                       | 2506.8                         | 120                          | 2501.8                            | 0.65            | 1.2           | 0.38              | 9.00      | 10.6           | 14.7 | 150                       | 6.3              | 54.9             | 38.8             | Silty Clay Loam             |
| 120                       | 2501.8                         | 125                          | 2496.8                            | 0.64            | 1.2           | 0.37              | 9.10      | 14.4           | 20.2 | 156                       | 0                | 50               | 50               | Silty Clay                  |
| 125                       | 2496.8                         | 130                          | 2491.8                            | 0.42            | 1.3           | 0.26              | 9.00      | 11.1           | 19.1 | 159                       | 3.8              | 46.2             | 50               | Silty Clay                  |
| 145                       | 2476.8                         | 150                          | 2471.8                            | 0.54            | 1.3           | 0.32              | 8.90      | 16.4           | 25.1 | 141                       | 30               | 36.2             | 33.8             | Clay Loam                   |
| 150                       | 2471.8                         | 155                          | 2466.8                            | 0.41            | 0.98          | 0.21              | 9.10      | 12.3           | 22.1 | 156                       | 11.3             | 58.7             | 30               | Silty Clay Loam             |
| 155                       | 2466.8                         | 160                          | 2461.8                            | 0.38            | 0.80          | 0.27              | 9.20      | 9.9            | 17.5 | 185                       | 0                | 51.2             | 48.8             | Silty Clay                  |

Statistical Summary

|         |     |      |     |     |      |      |      |    |      |      |
|---------|-----|------|-----|-----|------|------|------|----|------|------|
| Min     | 0.3 | 0.27 | 0.2 | 7.4 | 0.75 | 0.84 | 36.9 | 0  | 4.9  | 10   |
| Average | 1   | 2    | 1   | 9   | 11   | 14   | 140  | 34 | 34   | 33   |
| Max     | 2.4 | 6.2  | 2.5 | 9.2 | 21.6 | 30.3 | 246  | 85 | 62.4 | 51.3 |
| Number  | 28  | 28   | 28  | 28  | 28   | 28   | 28   | 28 | 28   | 28   |

Depth to Coal: 130 ft bgs

Statistical Summary Above Coal

|         |     |     |     |     |      |      |      |    |      |      |
|---------|-----|-----|-----|-----|------|------|------|----|------|------|
| Min     | 0.3 | 0.3 | 0.2 | 7.4 | 0.8  | 0.8  | 36.9 | 0  | 4.9  | 10.0 |
| Average | 1   | 2   | 1   | 9   | 11   | 13   | 138  | 36 | 32   | 32   |
| Max     | 2.4 | 6.2 | 2.5 | 9.1 | 21.6 | 30.3 | 246  | 85 | 62.4 | 51.3 |
| Number  | 25  | 25  | 25  | 25  | 25   | 25   | 25   | 25 | 25   | 25   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Pace Analytical Services, Inc. of Billings, MT

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
- ft amsl = feet above mean sea level
- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite

APPENDIX 2.3-6.99

OVERBURDEN ANALYSIS DATA FOR SHOB-202R

| Sample Top Depth (ft bgs) | Sample Top Elevation (ft amsl) | Sample Bottom Depth (ft bgs) | Sample Bottom Elevation (ft amsl) | Calcium (meq/l) | EC (mmhos/cm) | Magnesium (meq/l) | pH (S.U.) | Sodium (meq/l) | SAR  | Saturation Percentage (%) | Percent Sand (%) | Percent Silt (%) | Percent Clay (%) | Texture                    |
|---------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------|---------------|-------------------|-----------|----------------|------|---------------------------|------------------|------------------|------------------|----------------------------|
| 0                         | 2578.8                         | 5                            | 2573.8                            | 23.5            | 4.2           | 19.4              | 8.3       | 9.9            | 2.1  | 116                       | 10               | 27.5             | 62.5             | Clay                       |
| 5                         | 2573.8                         | 10                           | 2568.8                            | 21.6            | 8.2           | 49.8              | 7.4       | 42.6           | 7.1  | 125                       | 26.3             | 26.2             | 47.5             | Clay                       |
| 10                        | 2568.8                         | 15                           | 2563.8                            | 22.4            | 7.6           | 40.1              | 3.6       | 37.0           | 6.6  | 104                       | 82.5             | 5                | 12.5             | Sandy Loam/Loamy Sand      |
| 15                        | 2563.8                         | 20                           | 2558.8                            | 21.2            | 6.7           | 34.5              | 3.6       | 32.6           | 6.2  | 104                       | 32.5             | 23.7             | 43.8             | Clay                       |
| 20                        | 2558.8                         | 25                           | 2553.8                            | 16.0            | 5.5           | 24.6              | 4.9       | 29.4           | 6.5  | 174                       | 7.5              | 33.7             | 58.8             | Clay                       |
| 25                        | 2553.8                         | 30                           | 2548.8                            | 3.3             | 4.1           | 9.7               | 7.3       | 30.4           | 11.9 | 205                       | 13.8             | 22.4             | 63.8             | Clay                       |
| 30                        | 2548.8                         | 35                           | 2543.8                            | 5.6             | 3.8           | 11.0              | 8.1       | 40.5           | 14.1 | 149                       | 25               | 31.2             | 43.8             | Clay                       |
| 35                        | 2543.8                         | 40                           | 2538.8                            | 2.5             | 2.9           | 3.3               | 8.8       | 31.5           | 18.6 | 135                       | 6.3              | 53.7             | 40               | Silty Clay Loam/Silty Clay |
| 40                        | 2538.8                         | 45                           | 2533.8                            | 2.1             | 3.9           | 2.3               | 8.3       | 35.7           | 24.1 | 125                       | 12.5             | 53.7             | 33.8             | Silty Clay Loam            |
| 45                        | 2533.8                         | 50                           | 2528.8                            | 1.2             | 2.4           | 0.89              | 8.6       | 22.4           | 21.8 | 151                       | 15               | 53.7             | 31.3             | Silty Clay Loam            |
| 50                        | 2528.8                         | 55                           | 2523.8                            | 0.94            | 1.8           | 0.70              | 8.9       | 22.0           | 24.3 | 178                       | 20               | 48.7             | 31.3             | Silty Clay Loam/Clay Loam  |
| 55                        | 2523.8                         | 60                           | 2518.8                            | 0.68            | 2.7           | 0.55              | 9.2       | 25.2           | 32.2 | 135                       | 36.3             | 37.4             | 26.3             | Loam                       |
| 60                        | 2518.8                         | 65                           | 2513.8                            | 0.82            | 1.7           | 0.58              | 9.0       | 17.5           | 20.9 | 146                       | 32.5             | 42.5             | 25               | Loam                       |
| 65                        | 2513.8                         | 70                           | 2508.8                            | 0.98            | 3.4           | 0.74              | 9.1       | 36.3           | 39.1 | 92.6                      | 50               | 30               | 20               | Loam                       |
| 70                        | 2508.8                         | 75                           | 2503.8                            | 0.87            | 2.1           | 0.58              | 8.9       | 23.9           | 28.1 | 119                       | 33.8             | 41.2             | 25               | Loam                       |
| 75                        | 2503.8                         | 80                           | 2498.8                            | 0.88            | 2.1           | 0.60              | 8.9       | 25.7           | 29.8 | 130                       | 61.3             | 18.7             | 20               | Sandy Loam/Sandy Clay Loam |
| 95                        | 2483.8                         | 100                          | 2478.8                            | 0.93            | 1.6           | 0.62              | 8.6       | 14.6           | 16.5 | 185                       | 43.8             | 26.2             | 30               | Clay Loam                  |
| 100                       | 2478.8                         | 105                          | 2473.8                            | 0.89            | 1.5           | 1.1               | 9.1       | 14.7           | 14.6 | 177                       | 12.5             | 52.5             | 35               | Silty Clay Loam            |
| 105                       | 2473.8                         | 110                          | 2468.8                            | 0.74            | 1.2           | 0.46              | 9.2       | 11.3           | 14.7 | 147                       | 13.8             | 56.2             | 30               | Silty Clay Loam            |

Statistical Summary

|         |      |     |      |     |      |      |      |      |      |      |
|---------|------|-----|------|-----|------|------|------|------|------|------|
| Min     | 0.68 | 1.2 | 0.46 | 3.6 | 9.9  | 2.1  | 92.6 | 6.3  | 5    | 12.5 |
| Average | 7    | 4   | 11   | 8   | 26   | 18   | 142  | 28   | 36   | 36   |
| Max     | 23.5 | 8.2 | 49.8 | 9.2 | 42.6 | 39.1 | 205  | 82.5 | 56.2 | 63.8 |
| Number  | 19   | 19  | 19   | 19  | 19   | 19   | 19   | 19   | 19   | 19   |

Depth to Coal: 80 ft bgs

Statistical Summary Above Coal

|         |      |     |      |     |      |      |      |      |      |      |
|---------|------|-----|------|-----|------|------|------|------|------|------|
| Min     | 0.68 | 1.7 | 0.55 | 3.6 | 9.9  | 2.1  | 92.6 | 6.3  | 5    | 12.5 |
| Average | 8    | 4   | 12   | 8   | 29   | 18   | 137  | 29   | 34   | 37   |
| Max     | 23.5 | 8.2 | 49.8 | 9.2 | 42.6 | 39.1 | 205  | 82.5 | 53.7 | 63.8 |
| Number  | 16   | 16  | 16   | 16  | 16   | 16   | 16   | 16   | 16   | 16   |

NOTES:

- EC: Electrical Conductivity
- SAR: Sodium Adsorption Ratio
- No analysis available for blank geochemistry cells
- Duplicates not shown in data set
- Arithmetic mean shown
- mmhos/cm = millimhos per centimeter
- Analyses performed by Pace Analytical Services, Inc. of Billings, MT

- meq/l = milliequivalent per liter
- S.U. = standard units
- % = percent
- ft bgs = feet below ground surface
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- When sample top depth = sample bottom depth, sample was a discrete sample rather than composite