

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31325**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/08/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>50</b>	mg/L
Oxygen	<b>4</b>	ppb
pH	<b>8.77</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>280.6</b>	mg/L
Carbonate	<b>588</b>	mg/L
Conductivity (Calculated)	<b>1147</b>	µS - cm3
Ionic Strength	<b>0.01</b>	
Resistivity	<b>8.718</b>	ohms - m
Specific Gravity	<b>1.0001</b>	
Total Dissolved Solids	<b>744.106</b>	mg/L

Cations	Result	Unit
Iron	<b>9.98</b>	mg/L
Manganese	<b>0.196</b>	mg/L
Barium	<b>0.26</b>	mg/L
Strontium	<b>0.48</b>	mg/L
Calcium	<b>23.55</b>	mg/L
Magnesium	<b>11.55</b>	mg/L
Sodium	<b>19.49</b>	mg/L
Potassium	<b>1.79</b>	mg/L
Boron	<b>0.16</b>	mg/L
Lithium	<b>0.11</b>	mg/L
Zinc	<b>0.83</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>2.80</b>	mg/L
Aluminum	<b>0.20</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>268</b>	mg/L
Fluoride	<b>71</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>130</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.11</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.71</b>
Calcite CaCO3 PTB	<b>16.9</b>
Calcite CaCO3 SI	<b>0.84</b>
Celestite SrSO4 SI	<b>-2.18</b>
Gypsum CaSO4 SI	<b>-2.72</b>
Hemihydrate CaSO4 SI	<b>-2.43</b>

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Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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Report Date: **09/08/2017**

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Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>Inteferece</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>8.88</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>341.6</b>	mg/L
Carbonate	<b>744</b>	mg/L
Conductivity (Calculated)	<b>1256</b>	µS - cm3
Ionic Strength	<b>0.01</b>	
Resistivity	<b>7.962</b>	ohms - m
Specific Gravity	<b>1.0002</b>	
Total Dissolved Solids	<b>902.244</b>	mg/L

Cations	Result	Unit
Iron	<b>96.96</b>	mg/L
Manganese	<b>1.364</b>	mg/L
Barium	<b>0.38</b>	mg/L
Strontium	<b>0.49</b>	mg/L
Calcium	<b>28.10</b>	mg/L
Magnesium	<b>10.53</b>	mg/L
Sodium	<b>40.82</b>	mg/L
Potassium	<b>2.00</b>	mg/L
Boron	<b>0.23</b>	mg/L
Lithium	<b>0.62</b>	mg/L
Zinc	<b>1.13</b>	mg/L
Lead	<b>0.09</b>	mg/L
Silicon	<b>3.04</b>	mg/L
Aluminum	<b>0.37</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>280</b>	mg/L
Fluoride	<b>68</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>102</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.13</b>
Barite BaSO4 PTB	<b>0.2</b>
Barite BaSO4 SI	<b>0.78</b>
Calcite CaCO3 PTB	<b>22.2</b>
Calcite CaCO3 SI	<b>1.11</b>
Celestite SrSO4 SI	<b>-2.27</b>
Gypsum CaSO4 SI	<b>-2.75</b>
Hemihydrate CaSO4 SI	<b>-2.45</b>

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System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>3.5</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.94</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>366</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>4463</b>	µS - cm3
Ionic Strength	<b>0.05</b>	
Resistivity	<b>2.241</b>	ohms - m
Specific Gravity	<b>1.0019</b>	
Total Dissolved Solids	<b>2926.155</b>	mg/L

Cations	Result	Unit
Iron	<b>68.34</b>	mg/L
Manganese	<b>1.435</b>	mg/L
Barium	<b>2.09</b>	mg/L
Strontium	<b>5.94</b>	mg/L
Calcium	<b>69.68</b>	mg/L
Magnesium	<b>12.33</b>	mg/L
Sodium	<b>989.34</b>	mg/L
Potassium	<b>15.57</b>	mg/L
Boron	<b>1.82</b>	mg/L
Lithium	<b>0.82</b>	mg/L
Zinc	<b>0.64</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>3.53</b>	mg/L
Aluminum	<b>0.24</b>	mg/L

Anions	Result	Unit
Bromide	<b>21</b>	mg/L
Chloride	<b>1366</b>	mg/L
Fluoride	<b>6</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>45</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.18</b>
Barite BaSO4 PTB	<b>1.1</b>
Barite BaSO4 SI	<b>0.97</b>
Calcite CaCO3 PTB	<b>30.0</b>
Calcite CaCO3 SI	<b>0.43</b>
Celestite SrSO4 SI	<b>-1.68</b>
Gypsum CaSO4 SI	<b>-2.79</b>
Hemihydrate CaSO4 SI	<b>-2.53</b>

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Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31328**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>0.5</b>	mg/L
Oxygen	<b>3</b>	ppb
pH	<b>7.5</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>536</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5254</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.903</b>	ohms - m
Specific Gravity	<b>1.0021</b>	
Total Dissolved Solids	<b>3374.063</b>	mg/L

Cations	Result	Unit
Iron	<b>10.73</b>	mg/L
Manganese	<b>0.783</b>	mg/L
Barium	<b>1.45</b>	mg/L
Strontium	<b>6.03</b>	mg/L
Calcium	<b>68.74</b>	mg/L
Magnesium	<b>12.63</b>	mg/L
Sodium	<b>1115.70</b>	mg/L
Potassium	<b>16.93</b>	mg/L
Boron	<b>1.97</b>	mg/L
Lithium	<b>0.83</b>	mg/L
Zinc	<b>0.56</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>1.53</b>	mg/L
Aluminum	<b>0.07</b>	mg/L

Anions	Result	Unit
Bromide	<b>25</b>	mg/L
Chloride	<b>1577</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>45</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.20</b>
Barite BaSO4 PTB	<b>0.7</b>
Barite BaSO4 SI	<b>0.77</b>
Calcite CaCO3 PTB	<b>9.4</b>
Calcite CaCO3 SI	<b>0.10</b>
Celestite SrSO4 SI	<b>-1.71</b>
Gypsum CaSO4 SI	<b>-2.82</b>
Hemihydrate CaSO4 SI	<b>-2.56</b>

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System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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## Water Analysis Report

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Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/08/2017**

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Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>2</b>	mg/L
Oxygen	<b>12</b>	ppb
pH	<b>7.42</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>512.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5294</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.889</b>	ohms - m
Specific Gravity	<b>1.0018</b>	
Total Dissolved Solids	<b>3981.256</b>	mg/L

Cations	Result	Unit
Iron	<b>587.10</b>	mg/L
Manganese	<b>5.796</b>	mg/L
Barium	<b>2.91</b>	mg/L
Strontium	<b>6.21</b>	mg/L
Calcium	<b>72.20</b>	mg/L
Magnesium	<b>12.66</b>	mg/L
Sodium	<b>1138.98</b>	mg/L
Potassium	<b>16.71</b>	mg/L
Boron	<b>2.06</b>	mg/L
Lithium	<b>0.81</b>	mg/L
Zinc	<b>1.70</b>	mg/L
Lead	<b>0.07</b>	mg/L
Silicon	<b>7.40</b>	mg/L
Aluminum	<b>0.89</b>	mg/L

Anions	Result	Unit
Bromide	<b>25</b>	mg/L
Chloride	<b>1597</b>	mg/L
Fluoride	<b>3</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>46</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.17</b>
Barite BaSO4 PTB	<b>1.6</b>
Barite BaSO4 SI	<b>1.08</b>
Calcite CaCO3 PTB	<b>3.0</b>
Calcite CaCO3 SI	<b>0.03</b>
Celestite SrSO4 SI	<b>-1.69</b>
Gypsum CaSO4 SI	<b>-2.79</b>
Hemihydrate CaSO4 SI	<b>-2.54</b>

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Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31330**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.43</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>414.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5134</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.948</b>	ohms - m
Specific Gravity	<b>1.0020</b>	
Total Dissolved Solids	<b>3460.536</b>	mg/L

Cations	Result	Unit
Iron	<b>172.66</b>	mg/L
Manganese	<b>2.166</b>	mg/L
Barium	<b>2.39</b>	mg/L
Strontium	<b>6.51</b>	mg/L
Calcium	<b>69.60</b>	mg/L
Magnesium	<b>12.39</b>	mg/L
Sodium	<b>1168.02</b>	mg/L
Potassium	<b>17.33</b>	mg/L
Boron	<b>2.12</b>	mg/L
Lithium	<b>0.84</b>	mg/L
Zinc	<b>0.66</b>	mg/L
Lead	<b>0.08</b>	mg/L
Silicon	<b>4.14</b>	mg/L
Aluminum	<b>0.44</b>	mg/L

Anions	Result	Unit
Bromide	<b>25</b>	mg/L
Chloride	<b>1568</b>	mg/L
Fluoride	<b>5</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>44</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.19</b>
Barite BaSO4 PTB	<b>1.3</b>
Barite BaSO4 SI	<b>1.02</b>
Calcite CaCO3 SI	<b>-0.03</b>
Celestite SrSO4 SI	<b>-1.65</b>
Gypsum CaSO4 SI	<b>-2.80</b>
Hemihydrate CaSO4 SI	<b>-2.54</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

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Sample ID: **AJ31331**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.49</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>292.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>4944</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>2.023</b>	ohms - m
Specific Gravity	<b>1.0023</b>	
Total Dissolved Solids	<b>3370.229</b>	mg/L

Cations	Result	Unit
Iron	<b>203.58</b>	mg/L
Manganese	<b>2.429</b>	mg/L
Barium	<b>2.72</b>	mg/L
Strontium	<b>7.24</b>	mg/L
Calcium	<b>75.81</b>	mg/L
Magnesium	<b>13.06</b>	mg/L
Sodium	<b>1167.59</b>	mg/L
Potassium	<b>17.37</b>	mg/L
Boron	<b>2.24</b>	mg/L
Lithium	<b>0.84</b>	mg/L
Zinc	<b>0.35</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>5.56</b>	mg/L
Aluminum	<b>0.96</b>	mg/L

Anions	Result	Unit
Bromide	<b>24</b>	mg/L
Chloride	<b>1564</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>41</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.18</b>
Barite BaSO4 PTB	<b>1.4</b>
Barite BaSO4 SI	<b>1.04</b>
Calcite CaCO3 SI	<b>-0.08</b>
Celestite SrSO4 SI	<b>-1.64</b>
Gypsum CaSO4 SI	<b>-2.80</b>
Hemihydrate CaSO4 SI	<b>-2.54</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31332**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/08/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1.5</b>	mg/L
Oxygen	<b>5</b>	ppb
pH	<b>7.42</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>402.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5157</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.939</b>	ohms - m
Specific Gravity	<b>1.0020</b>	
Total Dissolved Solids	<b>3504.273</b>	mg/L

Cations	Result	Unit
Iron	<b>201.11</b>	mg/L
Manganese	<b>2.453</b>	mg/L
Barium	<b>2.74</b>	mg/L
Strontium	<b>6.88</b>	mg/L
Calcium	<b>69.90</b>	mg/L
Magnesium	<b>12.15</b>	mg/L
Sodium	<b>1088.44</b>	mg/L
Potassium	<b>16.31</b>	mg/L
Boron	<b>2.12</b>	mg/L
Lithium	<b>0.77</b>	mg/L
Zinc	<b>0.74</b>	mg/L
Lead	<b>0.11</b>	mg/L
Silicon	<b>5.91</b>	mg/L
Aluminum	<b>0.52</b>	mg/L

Anions	Result	Unit
Bromide	<b>26</b>	mg/L
Chloride	<b>1675</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Fluoride	<b>3</b>	mg/L
Sulfate	<b>43</b>	mg/L

Scale Type	Result
Calcite CaCO3 SI	<b>-0.09</b>
Celestite SrSO4 SI	<b>-1.67</b>
Anhydrite CaSO4 SI	<b>-3.22</b>
Barite BaSO4 PTB	<b>1.4</b>
Barite BaSO4 SI	<b>1.02</b>
Gypsum CaSO4 SI	<b>-2.83</b>
Hemihydrate CaSO4 SI	<b>-2.58</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31333**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>3</b>	ppb
pH	<b>7.26</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>414.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5190</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.927</b>	ohms - m
Specific Gravity	<b>1.0020</b>	
Total Dissolved Solids	<b>3448.819</b>	mg/L

Cations	Result	Unit
Iron	<b>125.21</b>	mg/L
Manganese	<b>2.309</b>	mg/L
Barium	<b>3.16</b>	mg/L
Strontium	<b>7.60</b>	mg/L
Calcium	<b>75.78</b>	mg/L
Magnesium	<b>12.79</b>	mg/L
Sodium	<b>1154.17</b>	mg/L
Potassium	<b>17.04</b>	mg/L
Boron	<b>2.29</b>	mg/L
Lithium	<b>0.80</b>	mg/L
Zinc	<b>0.45</b>	mg/L
Lead	<b>0.15</b>	mg/L
Silicon	<b>6.14</b>	mg/L
Aluminum	<b>0.28</b>	mg/L

Anions	Result	Unit
Bromide	<b>25</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Chloride	<b>1613</b>	mg/L
Fluoride	<b>3</b>	mg/L
Sulfate	<b>40</b>	mg/L

Scale Type	Result
Barite BaSO4 PTB	<b>1.7</b>
Barite BaSO4 SI	<b>1.05</b>
Calcite CaCO3 SI	<b>-0.21</b>
Celestite SrSO4 SI	<b>-1.66</b>
Anhydrite CaSO4 SI	<b>-3.21</b>
Gypsum CaSO4 SI	<b>-2.83</b>
Hemihydrate CaSO4 SI	<b>-2.58</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31334**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>0.5</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.26</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>305</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5034</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.986</b>	ohms - m
Specific Gravity	<b>1.0018</b>	
Total Dissolved Solids	<b>3396.801</b>	mg/L

Cations	Result	Unit
Iron	<b>172.06</b>	mg/L
Manganese	<b>2.721</b>	mg/L
Barium	<b>3.96</b>	mg/L
Strontium	<b>7.75</b>	mg/L
Calcium	<b>77.12</b>	mg/L
Magnesium	<b>12.79</b>	mg/L
Sodium	<b>1137.40</b>	mg/L
Potassium	<b>16.56</b>	mg/L
Boron	<b>2.30</b>	mg/L
Lithium	<b>0.75</b>	mg/L
Zinc	<b>0.53</b>	mg/L
Lead	<b>0.34</b>	mg/L
Silicon	<b>7.84</b>	mg/L
Aluminum	<b>0.58</b>	mg/L

Anions	Result	Unit
Bromide	<b>26</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Chloride	<b>1638</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>40</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.21</b>
Barite BaSO4 PTB	<b>2.1</b>
Barite BaSO4 SI	<b>1.15</b>
Calcite CaCO3 SI	<b>-0.33</b>
Celestite SrSO4 SI	<b>-1.65</b>
Gypsum CaSO4 SI	<b>-2.82</b>
Hemihydrate CaSO4 SI	<b>-2.57</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31335**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>0.5</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.24</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>317.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5061</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.976</b>	ohms - m
Specific Gravity	<b>1.0019</b>	
Total Dissolved Solids	<b>3516.14</b>	mg/L

Cations	Result	Unit
Iron	<b>273.78</b>	mg/L
Manganese	<b>3.560</b>	mg/L
Barium	<b>3.16</b>	mg/L
Strontium	<b>7.23</b>	mg/L
Calcium	<b>75.88</b>	mg/L
Magnesium	<b>12.11</b>	mg/L
Sodium	<b>1054.22</b>	mg/L
Potassium	<b>15.66</b>	mg/L
Boron	<b>2.13</b>	mg/L
Lithium	<b>0.75</b>	mg/L
Zinc	<b>0.78</b>	mg/L
Lead	<b>0.10</b>	mg/L
Silicon	<b>8.48</b>	mg/L
Aluminum	<b>0.68</b>	mg/L

Anions	Result	Unit
Bromide	<b>27</b>	mg/L
Chloride	<b>1729</b>	mg/L
Fluoride	<b>3</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>40</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.21</b>
Barite BaSO4 PTB	<b>1.7</b>
Barite BaSO4 SI	<b>1.05</b>
Calcite CaCO3 SI	<b>-0.34</b>
Celestite SrSO4 SI	<b>-1.68</b>
Gypsum CaSO4 SI	<b>-2.83</b>
Hemihydrate CaSO4 SI	<b>-2.58</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31336**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1.5</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.27</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>317.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5335</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.874</b>	ohms - m
Specific Gravity	<b>1.0021</b>	
Total Dissolved Solids	<b>3571.61</b>	mg/L

Cations	Result	Unit
Iron	<b>154.95</b>	mg/L
Manganese	<b>2.510</b>	mg/L
Barium	<b>3.82</b>	mg/L
Strontium	<b>8.21</b>	mg/L
Calcium	<b>81.08</b>	mg/L
Magnesium	<b>13.50</b>	mg/L
Sodium	<b>1213.34</b>	mg/L
Potassium	<b>17.35</b>	mg/L
Boron	<b>2.45</b>	mg/L
Lithium	<b>0.84</b>	mg/L
Zinc	<b>0.18</b>	mg/L
Lead	<b>0.08</b>	mg/L
Silicon	<b>7.14</b>	mg/L
Aluminum	<b>0.38</b>	mg/L

Anions	Result	Unit
Bromide	<b>27</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Chloride	<b>1737</b>	mg/L
Fluoride	<b>2</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>40</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.19</b>
Barite BaSO4 PTB	<b>2.1</b>
Barite BaSO4 SI	<b>1.13</b>
Hemihydrate CaSO4 SI	<b>-2.55</b>
Calcite CaCO3 SI	<b>-0.28</b>
Celestite SrSO4 SI	<b>-1.63</b>
Gypsum CaSO4 SI	<b>-2.80</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31337**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>4</b>	ppb
pH	<b>7.25</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>341.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5492</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.821</b>	ohms - m
Specific Gravity	<b>1.0025</b>	
Total Dissolved Solids	<b>3737.336</b>	mg/L

Cations	Result	Unit
Iron	<b>219.58</b>	mg/L
Manganese	<b>2.946</b>	mg/L
Barium	<b>4.12</b>	mg/L
Strontium	<b>8.31</b>	mg/L
Calcium	<b>81.81</b>	mg/L
Magnesium	<b>13.65</b>	mg/L
Sodium	<b>1229.32</b>	mg/L
Potassium	<b>17.42</b>	mg/L
Boron	<b>2.55</b>	mg/L
Lithium	<b>0.82</b>	mg/L
Zinc	<b>0.59</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>8.49</b>	mg/L
Aluminum	<b>0.54</b>	mg/L

Anions	Result	Unit
Nitrate	<b>Not Detected</b>	mg/L
Sulfate	<b>39</b>	mg/L
Bromide	<b>28</b>	mg/L
Chloride	<b>1797</b>	mg/L
Fluoride	<b>3</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.19</b>
Barite BaSO4 PTB	<b>2.2</b>
Barite BaSO4 SI	<b>1.15</b>
Gypsum CaSO4 SI	<b>-2.81</b>
Hemihydrate CaSO4 SI	<b>-2.56</b>
Calcite CaCO3 SI	<b>-0.27</b>
Celestite SrSO4 SI	<b>-1.63</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ31338**

Login Batch: **2017-09-07-001**

Collection Date: **09/03/2017**

Receive Date: **09/07/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>12</b>	ppb
pH	<b>7.25</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>378.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5618</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.780</b>	ohms - m
Specific Gravity	<b>1.0022</b>	
Total Dissolved Solids	<b>3884.285</b>	mg/L

Cations	Result	Unit
Iron	<b>285.71</b>	mg/L
Manganese	<b>3.375</b>	mg/L
Barium	<b>4.53</b>	mg/L
Strontium	<b>8.43</b>	mg/L
Calcium	<b>83.21</b>	mg/L
Magnesium	<b>13.78</b>	mg/L
Sodium	<b>1223.05</b>	mg/L
Potassium	<b>16.85</b>	mg/L
Boron	<b>2.54</b>	mg/L
Lithium	<b>0.84</b>	mg/L
Zinc	<b>0.90</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>9.94</b>	mg/L
Aluminum	<b>0.94</b>	mg/L

Anions	Result	Unit
Fluoride	<b>3</b>	mg/L
Sulfate	<b>39</b>	mg/L
Bromide	<b>28</b>	mg/L
Chloride	<b>1845</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.19</b>
Barite BaSO4 PTB	<b>2.5</b>
Barite BaSO4 SI	<b>1.19</b>
Gypsum CaSO4 SI	<b>-2.80</b>
Hemihydrate CaSO4 SI	<b>-2.55</b>
Calcite CaCO3 SI	<b>-0.21</b>
Celestite SrSO4 SI	<b>-1.63</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34447**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>8030</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>4</b>	ppb
pH	<b>5.36</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>85.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5653</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.769</b>	ohms - m
Specific Gravity	<b>1.0062</b>	
Total Dissolved Solids	<b>3648.729</b>	mg/L

Cations	Result	Unit
Iron	<b>28.02</b>	mg/L
Manganese	<b>3.099</b>	mg/L
Barium	<b>1.39</b>	mg/L
Strontium	<b>8.55</b>	mg/L
Calcium	<b>92.67</b>	mg/L
Magnesium	<b>13.97</b>	mg/L
Sodium	<b>1387.63</b>	mg/L
Potassium	<b>18.45</b>	mg/L
Boron	<b>2.84</b>	mg/L
Lithium	<b>0.83</b>	mg/L
Zinc	<b>0.11</b>	mg/L
Lead	<b>0.10</b>	mg/L
Silicon	<b>4.76</b>	mg/L
Aluminum	<b>0.22</b>	mg/L

Anions	Result	Unit
Bromide	<b>27</b>	mg/L
Chloride	<b>2003</b>	mg/L
Fluoride	<b>1</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>25</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.34</b>
Barite BaSO4 PTB	<b>0.5</b>
Barite BaSO4 SI	<b>0.49</b>
Calcite CaCO3 SI	<b>-2.70</b>
Celestite SrSO4 SI	<b>-1.82</b>
Gypsum CaSO4 SI	<b>-2.95</b>
Hemihydrate CaSO4 SI	<b>-2.70</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34448**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.28</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>378.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>6104</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.638</b>	ohms - m
Specific Gravity	<b>1.0024</b>	
Total Dissolved Solids	<b>4210.76</b>	mg/L

Cations	Result	Unit
Iron	<b>300.53</b>	mg/L
Manganese	<b>3.960</b>	mg/L
Barium	<b>4.77</b>	mg/L
Strontium	<b>9.09</b>	mg/L
Calcium	<b>95.93</b>	mg/L
Magnesium	<b>14.74</b>	mg/L
Sodium	<b>1391.54</b>	mg/L
Potassium	<b>18.07</b>	mg/L
Boron	<b>2.89</b>	mg/L
Lithium	<b>0.82</b>	mg/L
Zinc	<b>0.75</b>	mg/L
Lead	<b>0.14</b>	mg/L
Silicon	<b>10.16</b>	mg/L
Aluminum	<b>1.07</b>	mg/L

Anions	Result	Unit
Bromide	<b>29</b>	mg/L
Chloride	<b>1904</b>	mg/L
Fluoride	<b>2</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>108</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.71</b>
Barite BaSO4 PTB	<b>2.7</b>
Barite BaSO4 SI	<b>1.60</b>
Calcite CaCO3 SI	<b>-0.16</b>
Celestite SrSO4 SI	<b>-1.20</b>
Gypsum CaSO4 SI	<b>-2.33</b>
Hemihydrate CaSO4 SI	<b>-2.08</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34449**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>4</b>	ppb
pH	<b>7.33</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>378.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>6100</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.639</b>	ohms - m
Specific Gravity	<b>1.0036</b>	
Total Dissolved Solids	<b>3938.37</b>	mg/L

Cations	Result	Unit
Iron	<b>32.23</b>	mg/L
Manganese	<b>2.350</b>	mg/L
Barium	<b>1.96</b>	mg/L
Strontium	<b>8.60</b>	mg/L
Calcium	<b>89.73</b>	mg/L
Magnesium	<b>13.84</b>	mg/L
Sodium	<b>1424.46</b>	mg/L
Potassium	<b>17.83</b>	mg/L
Boron	<b>2.86</b>	mg/L
Lithium	<b>0.82</b>	mg/L
Zinc	<b>0.13</b>	mg/L
Lead	<b>0.16</b>	mg/L
Silicon	<b>3.35</b>	mg/L
Aluminum	<b>0.05</b>	mg/L

Anions	Result	Unit
Bromide	<b>30</b>	mg/L
Chloride	<b>1953</b>	mg/L
Fluoride	<b>1</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>34</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.23</b>
Barite BaSO4 PTB	<b>0.9</b>
Barite BaSO4 SI	<b>0.73</b>
Calcite CaCO3 SI	<b>-0.14</b>
Celestite SrSO4 SI	<b>-1.71</b>
Gypsum CaSO4 SI	<b>-2.85</b>
Hemihydrate CaSO4 SI	<b>-2.60</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34450**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.3</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>378.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>6123</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.633</b>	ohms - m
Specific Gravity	<b>1.0033</b>	
Total Dissolved Solids	<b>4581.13</b>	mg/L

Cations	Result	Unit
Iron	<b>654.83</b>	mg/L
Manganese	<b>7.550</b>	mg/L
Barium	<b>4.53</b>	mg/L
Strontium	<b>8.96</b>	mg/L
Calcium	<b>97.28</b>	mg/L
Magnesium	<b>14.23</b>	mg/L
Sodium	<b>1409.55</b>	mg/L
Potassium	<b>18.06</b>	mg/L
Boron	<b>2.91</b>	mg/L
Lithium	<b>0.86</b>	mg/L
Zinc	<b>0.26</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>11.82</b>	mg/L
Aluminum	<b>0.94</b>	mg/L

Anions	Result	Unit
Bromide	<b>30</b>	mg/L
Chloride	<b>1971</b>	mg/L
Fluoride	<b>1</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>35</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.19</b>
Barite BaSO4 PTB	<b>2.4</b>
Barite BaSO4 SI	<b>1.10</b>
Calcite CaCO3 SI	<b>-0.14</b>
Celestite SrSO4 SI	<b>-1.68</b>
Gypsum CaSO4 SI	<b>-2.80</b>
Hemihydrate CaSO4 SI	<b>-2.56</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34451**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.6</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>378.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>6004</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.666</b>	ohms - m
Specific Gravity	<b>1.0033</b>	
Total Dissolved Solids	<b>3892.47</b>	mg/L

Cations	Result	Unit
Iron	<b>48.16</b>	mg/L
Manganese	<b>1.800</b>	mg/L
Barium	<b>2.76</b>	mg/L
Strontium	<b>8.34</b>	mg/L
Calcium	<b>84.79</b>	mg/L
Magnesium	<b>13.31</b>	mg/L
Sodium	<b>1353.11</b>	mg/L
Potassium	<b>17.18</b>	mg/L
Boron	<b>2.67</b>	mg/L
Lithium	<b>0.79</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>0.06</b>	mg/L
Silicon	<b>3.61</b>	mg/L
Aluminum	<b>0.03</b>	mg/L

Anions	Result	Unit
Bromide	<b>30</b>	mg/L
Chloride	<b>1968</b>	mg/L
Fluoride	<b>1</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>34</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.26</b>
Barite BaSO4 PTB	<b>1.4</b>
Barite BaSO4 SI	<b>0.88</b>
Calcite CaCO3 PTB	<b>9.3</b>
Calcite CaCO3 SI	<b>0.10</b>
Celestite SrSO4 SI	<b>-1.72</b>
Gypsum CaSO4 SI	<b>-2.87</b>
Hemihydrate CaSO4 SI	<b>-2.63</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34451**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34452**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.38</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>402.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>6024</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.660</b>	ohms - m
Specific Gravity	<b>1.0038</b>	
Total Dissolved Solids	<b>4117.868</b>	mg/L

Cations	Result	Unit
Iron	<b>258.45</b>	mg/L
Manganese	<b>4.028</b>	mg/L
Barium	<b>4.44</b>	mg/L
Strontium	<b>9.64</b>	mg/L
Calcium	<b>96.98</b>	mg/L
Magnesium	<b>15.00</b>	mg/L
Sodium	<b>1522.73</b>	mg/L
Potassium	<b>19.07</b>	mg/L
Boron	<b>3.01</b>	mg/L
Lithium	<b>0.88</b>	mg/L
Zinc	<b>0.35</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>7.59</b>	mg/L
Aluminum	<b>0.13</b>	mg/L

Anions	Result	Unit
Bromide	<b>27</b>	mg/L
Chloride	<b>1774</b>	mg/L
Fluoride	<b>1</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>30</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.24</b>
Barite BaSO4 PTB	<b>2.4</b>
Barite BaSO4 SI	<b>1.07</b>
Calcite CaCO3 PTB	<b>1.3</b>
Calcite CaCO3 SI	<b>0.01</b>
Celestite SrSO4 SI	<b>-1.69</b>
Gypsum CaSO4 SI	<b>-2.86</b>
Hemihydrate CaSO4 SI	<b>-2.60</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34452**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34453**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>12</b>	ppb
pH	<b>7.32</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>402.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5733</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.744</b>	ohms - m
Specific Gravity	<b>1.0037</b>	
Total Dissolved Solids	<b>3929.036</b>	mg/L

Cations	Result	Unit
Iron	<b>256.80</b>	mg/L
Manganese	<b>3.326</b>	mg/L
Barium	<b>4.23</b>	mg/L
Strontium	<b>8.63</b>	mg/L
Calcium	<b>88.69</b>	mg/L
Magnesium	<b>13.60</b>	mg/L
Sodium	<b>1341.16</b>	mg/L
Potassium	<b>16.55</b>	mg/L
Boron	<b>2.71</b>	mg/L
Lithium	<b>0.75</b>	mg/L
Zinc	<b>0.21</b>	mg/L
Lead	<b>0.01</b>	mg/L
Silicon	<b>8.33</b>	mg/L
Aluminum	<b>0.55</b>	mg/L

Anions	Result	Unit
Bromide	<b>27</b>	mg/L
Chloride	<b>1781</b>	mg/L
Fluoride	<b>1</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>29</b>	mg/L

Scale Type	Result
Barite BaSO4 SI	<b>1.04</b>
Calcite CaCO3 SI	<b>-0.09</b>
Celestite SrSO4 SI	<b>-1.75</b>
Gypsum CaSO4 SI	<b>-2.90</b>
Hemihydrate CaSO4 SI	<b>-2.65</b>
Anhydrite CaSO4 SI	<b>-3.29</b>
Barite BaSO4 PTB	<b>2.2</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34454**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.33</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>402.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>6231</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.605</b>	ohms - m
Specific Gravity	<b>1.0035</b>	
Total Dissolved Solids	<b>4282.811</b>	mg/L

Cations	Result	Unit
Iron	<b>290.98</b>	mg/L
Manganese	<b>3.771</b>	mg/L
Barium	<b>4.43</b>	mg/L
Strontium	<b>9.29</b>	mg/L
Calcium	<b>98.81</b>	mg/L
Magnesium	<b>15.26</b>	mg/L
Sodium	<b>1454.67</b>	mg/L
Potassium	<b>18.12</b>	mg/L
Boron	<b>2.91</b>	mg/L
Lithium	<b>0.84</b>	mg/L
Zinc	<b>0.82</b>	mg/L
Lead	<b>0.04</b>	mg/L
Silicon	<b>8.74</b>	mg/L
Aluminum	<b>1.11</b>	mg/L

Anions	Result	Unit
Bromide	<b>30</b>	mg/L
Chloride	<b>1970</b>	mg/L
Fluoride	<b>1</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>33</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.21</b>
Barite BaSO4 PTB	<b>2.4</b>
Barite BaSO4 SI	<b>1.07</b>
Calcite CaCO3 SI	<b>-0.07</b>
Celestite SrSO4 SI	<b>-1.69</b>
Gypsum CaSO4 SI	<b>-2.82</b>
Hemihydrate CaSO4 SI	<b>-2.58</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34455**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.59</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>475.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>5306</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.885</b>	ohms - m
Specific Gravity	<b>1.0030</b>	
Total Dissolved Solids	<b>3458.932</b>	mg/L

Cations	Result	Unit
Iron	<b>62.24</b>	mg/L
Manganese	<b>1.022</b>	mg/L
Barium	<b>2.18</b>	mg/L
Strontium	<b>6.75</b>	mg/L
Calcium	<b>73.09</b>	mg/L
Magnesium	<b>13.03</b>	mg/L
Sodium	<b>1175.82</b>	mg/L
Potassium	<b>15.32</b>	mg/L
Boron	<b>2.38</b>	mg/L
Lithium	<b>0.76</b>	mg/L
Zinc	<b>0.23</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>3.83</b>	mg/L
Aluminum	<b>0.67</b>	mg/L

Anions	Result	Unit
Bromide	<b>24</b>	mg/L
Chloride	<b>1607</b>	mg/L
Fluoride	<b>1</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>42</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.21</b>
Barite BaSO4 PTB	<b>1.1</b>
Barite BaSO4 SI	<b>0.91</b>
Calcite CaCO3 PTB	<b>15.5</b>
Calcite CaCO3 SI	<b>0.17</b>
Celestite SrSO4 SI	<b>-1.69</b>
Gypsum CaSO4 SI	<b>-2.82</b>
Hemihydrate CaSO4 SI	<b>-2.57</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34455**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34456**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>12</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>8.66</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>317.2</b>	mg/L
Carbonate	<b>300</b>	mg/L
Conductivity (Calculated)	<b>2218</b>	µS - cm3
Ionic Strength	<b>0.02</b>	
Resistivity	<b>4.509</b>	ohms - m
Specific Gravity	<b>1.0016</b>	
Total Dissolved Solids	<b>1442.059</b>	mg/L

Cations	Result	Unit
Iron	<b>21.63</b>	mg/L
Manganese	<b>1.079</b>	mg/L
Barium	<b>1.05</b>	mg/L
Strontium	<b>2.72</b>	mg/L
Calcium	<b>42.71</b>	mg/L
Magnesium	<b>10.02</b>	mg/L
Sodium	<b>363.65</b>	mg/L
Potassium	<b>6.10</b>	mg/L
Boron	<b>1.10</b>	mg/L
Lithium	<b>0.40</b>	mg/L
Zinc	<b>0.23</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>2.45</b>	mg/L
Aluminum	<b>0.14</b>	mg/L

Anions	Result	Unit
Bromide	<b>7</b>	mg/L
Chloride	<b>629</b>	mg/L
Fluoride	<b>2</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>53</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.26</b>
Barite BaSO4 PTB	<b>0.5</b>
Barite BaSO4 SI	<b>0.87</b>
Calcite CaCO3 PTB	<b>31.5</b>
Calcite CaCO3 SI	<b>0.97</b>
Celestite SrSO4 SI	<b>-1.86</b>
Gypsum CaSO4 SI	<b>-2.88</b>
Hemihydrate CaSO4 SI	<b>-2.60</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34456**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34457**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>4</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.98</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3196.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>7768</b>	µS - cm3
Ionic Strength	<b>0.06</b>	
Resistivity	<b>1.287</b>	ohms - m
Specific Gravity	<b>1.0038</b>	
Total Dissolved Solids	<b>5250.999</b>	mg/L

Cations	Result	Unit
Iron	<b>276.41</b>	mg/L
Manganese	<b>3.349</b>	mg/L
Barium	<b>0.83</b>	mg/L
Strontium	<b>3.82</b>	mg/L
Calcium	<b>41.95</b>	mg/L
Magnesium	<b>7.78</b>	mg/L
Sodium	<b>1295.46</b>	mg/L
Potassium	<b>82.73</b>	mg/L
Boron	<b>2.06</b>	mg/L
Lithium	<b>2.42</b>	mg/L
Zinc	<b>1.89</b>	mg/L
Lead	<b>0.98</b>	mg/L
Silicon	<b>42.99</b>	mg/L
Aluminum	<b>0.81</b>	mg/L

Anions	Result	Unit
Sulfate	<b>160</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>265</b>	mg/L
Fluoride	<b>3</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.89</b>
Barite BaSO4 PTB	<b>0.4</b>
Barite BaSO4 SI	<b>1.03</b>
Calcite CaCO3 PTB	<b>33.7</b>
Calcite CaCO3 SI	<b>1.11</b>
Celestite SrSO4 SI	<b>-1.39</b>
Gypsum CaSO4 SI	<b>-2.50</b>
Hemihydrate CaSO4 SI	<b>-2.26</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34457**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34458**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.87</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3306.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>8247</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.213</b>	ohms - m
Specific Gravity	<b>1.0036</b>	
Total Dissolved Solids	<b>5743.925</b>	mg/L

Cations	Result	Unit
Iron	<b>460.62</b>	mg/L
Manganese	<b>5.455</b>	mg/L
Barium	<b>0.90</b>	mg/L
Strontium	<b>4.30</b>	mg/L
Calcium	<b>46.66</b>	mg/L
Magnesium	<b>7.77</b>	mg/L
Sodium	<b>1511.02</b>	mg/L
Potassium	<b>94.93</b>	mg/L
Boron	<b>2.61</b>	mg/L
Lithium	<b>2.83</b>	mg/L
Zinc	<b>1.35</b>	mg/L
Lead	<b>0.33</b>	mg/L
Silicon	<b>47.16</b>	mg/L
Aluminum	<b>0.57</b>	mg/L

Anions	Result	Unit
Fluoride	<b>3</b>	mg/L
Sulfate	<b>166</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>235</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.83</b>
Barite BaSO4 PTB	<b>0.5</b>
Barite BaSO4 SI	<b>1.08</b>
Gypsum CaSO4 SI	<b>-2.44</b>
Hemihydrate CaSO4 SI	<b>-2.20</b>
Calcite CaCO3 PTB	<b>37.1</b>
Calcite CaCO3 SI	<b>1.06</b>
Celestite SrSO4 SI	<b>-1.32</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34458**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34459**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>8.08</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3477</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>8817</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.134</b>	ohms - m
Specific Gravity	<b>1.0050</b>	
Total Dissolved Solids	<b>6394.365</b>	mg/L

Cations	Result	Unit
Iron	<b>743.36</b>	mg/L
Manganese	<b>8.325</b>	mg/L
Barium	<b>1.07</b>	mg/L
Strontium	<b>4.86</b>	mg/L
Calcium	<b>55.01</b>	mg/L
Magnesium	<b>7.86</b>	mg/L
Sodium	<b>1705.88</b>	mg/L
Potassium	<b>96.46</b>	mg/L
Boron	<b>2.98</b>	mg/L
Lithium	<b>3.23</b>	mg/L
Zinc	<b>1.66</b>	mg/L
Lead	<b>0.30</b>	mg/L
Silicon	<b>51.33</b>	mg/L
Aluminum	<b>0.93</b>	mg/L

Anions	Result	Unit
Chloride	<b>225</b>	mg/L
Fluoride	<b>4</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>166</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.76</b>
Barite BaSO4 PTB	<b>0.6</b>
Gypsum CaSO4 SI	<b>-2.37</b>
Hemihydrate CaSO4 SI	<b>-2.13</b>
Barite BaSO4 SI	<b>1.15</b>
Calcite CaCO3 PTB	<b>45.9</b>
Calcite CaCO3 SI	<b>1.36</b>
Celestite SrSO4 SI	<b>-1.27</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34459**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34460**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>8.13</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4257.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10052</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.995</b>	ohms - m
Specific Gravity	<b>1.0054</b>	
Total Dissolved Solids	<b>7021.218</b>	mg/L

Cations	Result	Unit
Iron	<b>581.45</b>	mg/L
Manganese	<b>6.198</b>	mg/L
Barium	<b>1.24</b>	mg/L
Strontium	<b>4.50</b>	mg/L
Calcium	<b>47.24</b>	mg/L
Magnesium	<b>7.03</b>	mg/L
Sodium	<b>1742.76</b>	mg/L
Potassium	<b>93.43</b>	mg/L
Boron	<b>3.10</b>	mg/L
Lithium	<b>3.37</b>	mg/L
Zinc	<b>1.87</b>	mg/L
Lead	<b>0.42</b>	mg/L
Silicon	<b>48.27</b>	mg/L
Aluminum	<b>0.67</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>215</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>158</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.86</b>
Barite BaSO4 PTB	<b>0.7</b>
Barite BaSO4 SI	<b>1.16</b>
Calcite CaCO3 PTB	<b>39.6</b>
Calcite CaCO3 SI	<b>1.40</b>
Celestite SrSO4 SI	<b>-1.35</b>
Gypsum CaSO4 SI	<b>-2.47</b>
Hemihydrate CaSO4 SI	<b>-2.23</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34460**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34461**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.98</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3952.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9843</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.016</b>	ohms - m
Specific Gravity	<b>1.0053</b>	
Total Dissolved Solids	<b>6505.109</b>	mg/L

Cations	Result	Unit
Iron	<b>201.68</b>	mg/L
Manganese	<b>3.599</b>	mg/L
Barium	<b>0.48</b>	mg/L
Strontium	<b>4.27</b>	mg/L
Calcium	<b>44.60</b>	mg/L
Magnesium	<b>6.96</b>	mg/L
Sodium	<b>1924.72</b>	mg/L
Potassium	<b>99.01</b>	mg/L
Boron	<b>3.36</b>	mg/L
Lithium	<b>3.66</b>	mg/L
Zinc	<b>0.55</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>32.94</b>	mg/L
Aluminum	<b>0.28</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>210</b>	mg/L
Fluoride	<b>3</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>156</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.89</b>
Barite BaSO4 PTB	<b>0.2</b>
Barite BaSO4 SI	<b>0.75</b>
Calcite CaCO3 PTB	<b>36.4</b>
Calcite CaCO3 SI	<b>1.19</b>
Celestite SrSO4 SI	<b>-1.38</b>
Gypsum CaSO4 SI	<b>-2.50</b>
Hemihydrate CaSO4 SI	<b>-2.26</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34461**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34462**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>8.12</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3818.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9523</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.050</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>7183.882</b>	mg/L

Cations	Result	Unit
Iron	<b>1077.38</b>	mg/L
Manganese	<b>11.512</b>	mg/L
Barium	<b>1.34</b>	mg/L
Strontium	<b>4.15</b>	mg/L
Calcium	<b>48.52</b>	mg/L
Magnesium	<b>6.82</b>	mg/L
Sodium	<b>1837.56</b>	mg/L
Potassium	<b>91.41</b>	mg/L
Boron	<b>3.49</b>	mg/L
Lithium	<b>3.39</b>	mg/L
Zinc	<b>2.10</b>	mg/L
Lead	<b>0.33</b>	mg/L
Silicon	<b>48.49</b>	mg/L
Aluminum	<b>0.93</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>218</b>	mg/L
Fluoride	<b>3</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>160</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.84</b>
Barite BaSO4 PTB	<b>0.7</b>
Barite BaSO4 SI	<b>1.20</b>
Calcite CaCO3 PTB	<b>40.4</b>
Calcite CaCO3 SI	<b>1.35</b>
Celestite SrSO4 SI	<b>-1.38</b>
Gypsum CaSO4 SI	<b>-2.46</b>
Hemihydrate CaSO4 SI	<b>-2.22</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34462**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34463**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.92</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4111.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10149</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.985</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>6696.621</b>	mg/L

Cations	Result	Unit
Iron	<b>198.67</b>	mg/L
Manganese	<b>2.881</b>	mg/L
Barium	<b>0.43</b>	mg/L
Strontium	<b>4.17</b>	mg/L
Calcium	<b>38.75</b>	mg/L
Magnesium	<b>5.92</b>	mg/L
Sodium	<b>1917.40</b>	mg/L
Potassium	<b>93.75</b>	mg/L
Boron	<b>3.40</b>	mg/L
Lithium	<b>3.57</b>	mg/L
Zinc	<b>0.85</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>44.83</b>	mg/L
Aluminum	<b>0.50</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>268</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>149</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.96</b>
Barite BaSO4 PTB	<b>0.2</b>
Barite BaSO4 SI	<b>0.68</b>
Calcite CaCO3 PTB	<b>31.0</b>
Calcite CaCO3 SI	<b>1.09</b>
Celestite SrSO4 SI	<b>-1.40</b>
Gypsum CaSO4 SI	<b>-2.58</b>
Hemihydrate CaSO4 SI	<b>-2.34</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34463**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34464**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>8.04</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3989.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9791</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.021</b>	ohms - m
Specific Gravity	<b>1.0055</b>	
Total Dissolved Solids	<b>6387.415</b>	mg/L

Cations	Result	Unit
Iron	<b>119.55</b>	mg/L
Manganese	<b>1.695</b>	mg/L
Barium	<b>0.41</b>	mg/L
Strontium	<b>3.53</b>	mg/L
Calcium	<b>31.55</b>	mg/L
Magnesium	<b>5.53</b>	mg/L
Sodium	<b>1874.75</b>	mg/L
Potassium	<b>91.77</b>	mg/L
Boron	<b>3.51</b>	mg/L
Lithium	<b>3.59</b>	mg/L
Zinc	<b>0.30</b>	mg/L
Lead	<b>0.05</b>	mg/L
Silicon	<b>36.57</b>	mg/L
Aluminum	<b>0.15</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>211</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>14</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>150</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.05</b>
Barite BaSO4 PTB	<b>0.2</b>
Barite BaSO4 SI	<b>0.67</b>
Calcite CaCO3 PTB	<b>25.3</b>
Calcite CaCO3 SI	<b>1.10</b>
Celestite SrSO4 SI	<b>-1.47</b>
Gypsum CaSO4 SI	<b>-2.66</b>
Hemihydrate CaSO4 SI	<b>-2.43</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34464**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34465**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>12</b>	ppb
pH	<b>8.02</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4050.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9942</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.006</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>7081.141</b>	mg/L

Cations	Result	Unit
Iron	<b>710.37</b>	mg/L
Manganese	<b>7.901</b>	mg/L
Barium	<b>0.94</b>	mg/L
Strontium	<b>4.05</b>	mg/L
Calcium	<b>46.75</b>	mg/L
Magnesium	<b>7.08</b>	mg/L
Sodium	<b>1908.65</b>	mg/L
Potassium	<b>93.73</b>	mg/L
Boron	<b>3.62</b>	mg/L
Lithium	<b>3.57</b>	mg/L
Zinc	<b>1.97</b>	mg/L
Lead	<b>0.22</b>	mg/L
Silicon	<b>46.63</b>	mg/L
Aluminum	<b>1.77</b>	mg/L

Anions	Result	Unit
Sulfate	<b>146</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>199</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.89</b>
Barite BaSO4 PTB	<b>0.5</b>
Barite BaSO4 SI	<b>1.01</b>
Calcite CaCO3 PTB	<b>38.6</b>
Calcite CaCO3 SI	<b>1.26</b>
Celestite SrSO4 SI	<b>-1.43</b>
Gypsum CaSO4 SI	<b>-2.51</b>
Hemihydrate CaSO4 SI	<b>-2.27</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34465**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34466**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>8</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4331</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10288</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.972</b>	ohms - m
Specific Gravity	<b>1.0054</b>	
Total Dissolved Solids	<b>6636.498</b>	mg/L

Cations	Result	Unit
Iron	<b>51.59</b>	mg/L
Manganese	<b>0.758</b>	mg/L
Barium	<b>0.17</b>	mg/L
Strontium	<b>2.72</b>	mg/L
Calcium	<b>22.78</b>	mg/L
Magnesium	<b>5.05</b>	mg/L
Sodium	<b>1874.43</b>	mg/L
Potassium	<b>90.97</b>	mg/L
Boron	<b>3.65</b>	mg/L
Lithium	<b>3.61</b>	mg/L
Zinc	<b>0.16</b>	mg/L
Lead	<b>0.18</b>	mg/L
Silicon	<b>31.18</b>	mg/L
Aluminum	<b>0.19</b>	mg/L

Anions	Result	Unit
Chloride	<b>201</b>	mg/L
Fluoride	<b>4</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>147</b>	mg/L

Scale Type	Result
Calcite CaCO3 SI	<b>0.96</b>
Celestite SrSO4 SI	<b>-1.59</b>
Gypsum CaSO4 SI	<b>-2.81</b>
Anhydrite CaSO4 SI	<b>-3.19</b>
Barite BaSO4 PTB	<b>0.0</b>
Barite BaSO4 SI	<b>0.28</b>
Calcite CaCO3 PTB	<b>17.7</b>
Hemihydrate CaSO4 SI	<b>-2.57</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34466**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34467**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>8.04</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4013.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9922</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.008</b>	ohms - m
Specific Gravity	<b>1.0048</b>	
Total Dissolved Solids	<b>6934.737</b>	mg/L

Cations	Result	Unit
Iron	<b>578.47</b>	mg/L
Manganese	<b>6.267</b>	mg/L
Barium	<b>0.93</b>	mg/L
Strontium	<b>3.91</b>	mg/L
Calcium	<b>39.42</b>	mg/L
Magnesium	<b>6.10</b>	mg/L
Sodium	<b>1931.84</b>	mg/L
Potassium	<b>93.30</b>	mg/L
Boron	<b>3.74</b>	mg/L
Lithium	<b>3.60</b>	mg/L
Zinc	<b>1.99</b>	mg/L
Lead	<b>0.14</b>	mg/L
Silicon	<b>46.15</b>	mg/L
Aluminum	<b>1.10</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>203</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>151</b>	mg/L

Scale Type	Result
Calcite CaCO3 PTB	<b>32.2</b>
Calcite CaCO3 SI	<b>1.20</b>
Celestite SrSO4 SI	<b>-1.43</b>
Anhydrite CaSO4 SI	<b>-2.95</b>
Barite BaSO4 PTB	<b>0.5</b>
Barite BaSO4 SI	<b>1.02</b>
Gypsum CaSO4 SI	<b>-2.57</b>
Hemihydrate CaSO4 SI	<b>-2.33</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34467**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34468**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>12</b>	ppb
pH	<b>8.02</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4111.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9914</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.009</b>	ohms - m
Specific Gravity	<b>1.0053</b>	
Total Dissolved Solids	<b>6462.212</b>	mg/L

Cations	Result	Unit
Iron	<b>115.56</b>	mg/L
Manganese	<b>1.502</b>	mg/L
Barium	<b>0.30</b>	mg/L
Strontium	<b>3.12</b>	mg/L
Calcium	<b>26.50</b>	mg/L
Magnesium	<b>4.65</b>	mg/L
Sodium	<b>1853.18</b>	mg/L
Potassium	<b>87.77</b>	mg/L
Boron	<b>3.55</b>	mg/L
Lithium	<b>3.51</b>	mg/L
Zinc	<b>0.15</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>35.64</b>	mg/L
Aluminum	<b>0.09</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>201</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>145</b>	mg/L

Scale Type	Result
Calcite CaCO3 PTB	<b>20.9</b>
Calcite CaCO3 SI	<b>1.02</b>
Celestite SrSO4 SI	<b>-1.54</b>
Anhydrite CaSO4 SI	<b>-3.14</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.52</b>
Gypsum CaSO4 SI	<b>-2.75</b>
Hemihydrate CaSO4 SI	<b>-2.51</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34468**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34469**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>12</b>	ppb
pH	<b>8.03</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4221.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10132</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.987</b>	ohms - m
Specific Gravity	<b>1.0055</b>	
Total Dissolved Solids	<b>6705.729</b>	mg/L

Cations	Result	Unit
Iron	<b>218.90</b>	mg/L
Manganese	<b>2.599</b>	mg/L
Barium	<b>0.54</b>	mg/L
Strontium	<b>3.50</b>	mg/L
Calcium	<b>29.38</b>	mg/L
Magnesium	<b>4.74</b>	mg/L
Sodium	<b>1878.87</b>	mg/L
Potassium	<b>87.74</b>	mg/L
Boron	<b>3.65</b>	mg/L
Lithium	<b>3.42</b>	mg/L
Zinc	<b>0.62</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>42.18</b>	mg/L
Aluminum	<b>0.17</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>202</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>144</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.09</b>
Barite BaSO4 PTB	<b>0.3</b>
Barite BaSO4 SI	<b>0.77</b>
Calcite CaCO3 PTB	<b>23.6</b>
Calcite CaCO3 SI	<b>1.09</b>
Celestite SrSO4 SI	<b>-1.49</b>
Gypsum CaSO4 SI	<b>-2.71</b>
Hemihydrate CaSO4 SI	<b>-2.47</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34469**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34470**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>8.04</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4111.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10116</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.989</b>	ohms - m
Specific Gravity	<b>1.0058</b>	
Total Dissolved Solids	<b>7212.2</b>	mg/L

Cations	Result	Unit
Iron	<b>728.98</b>	mg/L
Manganese	<b>8.790</b>	mg/L
Barium	<b>0.63</b>	mg/L
Strontium	<b>3.81</b>	mg/L
Calcium	<b>40.69</b>	mg/L
Magnesium	<b>5.47</b>	mg/L
Sodium	<b>1945.43</b>	mg/L
Potassium	<b>89.92</b>	mg/L
Boron	<b>4.09</b>	mg/L
Lithium	<b>3.55</b>	mg/L
Zinc	<b>2.38</b>	mg/L
Lead	<b>0.17</b>	mg/L
Silicon	<b>46.83</b>	mg/L
Aluminum	<b>0.95</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>219</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>148</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.95</b>
Barite BaSO4 PTB	<b>0.3</b>
Barite BaSO4 SI	<b>0.84</b>
Calcite CaCO3 PTB	<b>33.4</b>
Calcite CaCO3 SI	<b>1.23</b>
Celestite SrSO4 SI	<b>-1.44</b>
Gypsum CaSO4 SI	<b>-2.56</b>
Hemihydrate CaSO4 SI	<b>-2.32</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34470**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34471**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>12</b>	ppb
pH	<b>7.99</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4660.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>11799</b>	µS - cm3
Ionic Strength	<b>0.10</b>	
Resistivity	<b>0.848</b>	ohms - m
Specific Gravity	<b>1.0065</b>	
Total Dissolved Solids	<b>8538.205</b>	mg/L

Cations	Result	Unit
Iron	<b>975.86</b>	mg/L
Manganese	<b>10.685</b>	mg/L
Barium	<b>0.98</b>	mg/L
Strontium	<b>2.40</b>	mg/L
Calcium	<b>30.05</b>	mg/L
Magnesium	<b>5.22</b>	mg/L
Sodium	<b>2316.61</b>	mg/L
Potassium	<b>100.12</b>	mg/L
Boron	<b>10.14</b>	mg/L
Lithium	<b>3.75</b>	mg/L
Zinc	<b>4.25</b>	mg/L
Lead	<b>0.24</b>	mg/L
Silicon	<b>35.48</b>	mg/L
Aluminum	<b>0.79</b>	mg/L

Anions	Result	Unit
Bromide	<b>3</b>	mg/L
Chloride	<b>343</b>	mg/L
Fluoride	<b>5</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>193</b>	mg/L

**Lenntech online TDS calculator result is 8640.7 ppm.  
Just checking calculation: BK 03-08-2018**

Scale Type	Result
Anhydrite CaSO4 SI	<b>-2.98</b>
Barite BaSO4 PTB	<b>0.5</b>
Barite BaSO4 SI	<b>1.11</b>
Calcite CaCO3 PTB	<b>24.0</b>
Calcite CaCO3 SI	<b>1.07</b>
Celestite SrSO4 SI	<b>-1.56</b>
Gypsum CaSO4 SI	<b>-2.60</b>
Hemihydrate CaSO4 SI	<b>-2.36</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34471**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34472**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>4</b>	ppb
pH	<b>8.14</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3891.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9555</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.047</b>	ohms - m
Specific Gravity	<b>1.0054</b>	
Total Dissolved Solids	<b>6189.753</b>	mg/L

Cations	Result	Unit
Iron	<b>74.08</b>	mg/L
Manganese	<b>0.653</b>	mg/L
Barium	<b>0.17</b>	mg/L
Strontium	<b>1.15</b>	mg/L
Calcium	<b>6.10</b>	mg/L
Magnesium	<b>4.64</b>	mg/L
Sodium	<b>1855.16</b>	mg/L
Potassium	<b>86.02</b>	mg/L
Boron	<b>3.27</b>	mg/L
Lithium	<b>3.22</b>	mg/L
Zinc	<b>0.56</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>32.11</b>	mg/L
Aluminum	<b>0.52</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>207</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>149</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.74</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.33</b>
Calcite CaCO3 PTB	<b>3.7</b>
Calcite CaCO3 SI	<b>0.51</b>
Celestite SrSO4 SI	<b>-1.92</b>
Gypsum CaSO4 SI	<b>-3.35</b>
Hemihydrate CaSO4 SI	<b>-3.11</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34472**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34473**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>3</b>	ppb
pH	<b>7.69</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4074.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9900</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.010</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>6659.06</b>	mg/L

Cations	Result	Unit
Iron	<b>320.44</b>	mg/L
Manganese	<b>2.520</b>	mg/L
Barium	<b>0.75</b>	mg/L
Strontium	<b>3.91</b>	mg/L
Calcium	<b>27.33</b>	mg/L
Magnesium	<b>4.80</b>	mg/L
Sodium	<b>1889.51</b>	mg/L
Potassium	<b>87.84</b>	mg/L
Boron	<b>3.25</b>	mg/L
Lithium	<b>3.59</b>	mg/L
Zinc	<b>0.29</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>47.99</b>	mg/L
Aluminum	<b>0.08</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>195</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>140</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.14</b>
Barite BaSO4 PTB	<b>0.4</b>
Barite BaSO4 SI	<b>0.90</b>
Calcite CaCO3 PTB	<b>19.0</b>
Calcite CaCO3 SI	<b>0.70</b>
Celestite SrSO4 SI	<b>-1.45</b>
Gypsum CaSO4 SI	<b>-2.75</b>
Hemihydrate CaSO4 SI	<b>-2.51</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34473**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34474**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>4</b>	ppb
pH	<b>7.78</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4050.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9949</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.005</b>	ohms - m
Specific Gravity	<b>1.0058</b>	
Total Dissolved Solids	<b>6632.618</b>	mg/L

Cations	Result	Unit
Iron	<b>262.75</b>	mg/L
Manganese	<b>2.218</b>	mg/L
Barium	<b>0.61</b>	mg/L
Strontium	<b>4.12</b>	mg/L
Calcium	<b>30.69</b>	mg/L
Magnesium	<b>5.01</b>	mg/L
Sodium	<b>1938.82</b>	mg/L
Potassium	<b>89.55</b>	mg/L
Boron	<b>3.29</b>	mg/L
Lithium	<b>3.65</b>	mg/L
Zinc	<b>0.54</b>	mg/L
Lead	<b>0.12</b>	mg/L
Silicon	<b>48.69</b>	mg/L
Aluminum	<b>0.49</b>	mg/L

Anions	Result	Unit
Sulfate	<b>142</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>196</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.08</b>
Barite BaSO4 PTB	<b>0.3</b>
Barite BaSO4 SI	<b>0.82</b>
Calcite CaCO3 PTB	<b>22.9</b>
Calcite CaCO3 SI	<b>0.84</b>
Celestite SrSO4 SI	<b>-1.42</b>
Gypsum CaSO4 SI	<b>-2.70</b>
Hemihydrate CaSO4 SI	<b>-2.46</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34474**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34475**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>5</b>	ppb
pH	<b>7.88</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4026</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9899</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.010</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>6457.506</b>	mg/L

Cations	Result	Unit
Iron	<b>120.54</b>	mg/L
Manganese	<b>1.526</b>	mg/L
Barium	<b>0.49</b>	mg/L
Strontium	<b>3.86</b>	mg/L
Calcium	<b>32.66</b>	mg/L
Magnesium	<b>5.61</b>	mg/L
Sodium	<b>1929.82</b>	mg/L
Potassium	<b>88.97</b>	mg/L
Boron	<b>3.26</b>	mg/L
Lithium	<b>3.63</b>	mg/L
Zinc	<b>0.19</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>40.77</b>	mg/L
Aluminum	<b>0.73</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>139</b>	mg/L
Chloride	<b>198</b>	mg/L
Fluoride	<b>5</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.07</b>
Barite BaSO4 PTB	<b>0.2</b>
Barite BaSO4 SI	<b>0.71</b>
Calcite CaCO3 PTB	<b>25.3</b>
Calcite CaCO3 SI	<b>0.96</b>
Celestite SrSO4 SI	<b>-1.46</b>
Gypsum CaSO4 SI	<b>-2.68</b>
Hemihydrate CaSO4 SI	<b>-2.44</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34475**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34476**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>8.11</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4514</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10606</b>	µS - cm3
Ionic Strength	<b>0.09</b>	
Resistivity	<b>0.943</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>7234.084</b>	mg/L

Cations	Result	Unit
Iron	<b>441.79</b>	mg/L
Manganese	<b>4.284</b>	mg/L
Barium	<b>0.94</b>	mg/L
Strontium	<b>4.24</b>	mg/L
Calcium	<b>34.34</b>	mg/L
Magnesium	<b>5.09</b>	mg/L
Sodium	<b>1887.40</b>	mg/L
Potassium	<b>87.99</b>	mg/L
Boron	<b>3.32</b>	mg/L
Lithium	<b>3.64</b>	mg/L
Zinc	<b>0.59</b>	mg/L
Lead	<b>0.05</b>	mg/L
Silicon	<b>48.72</b>	mg/L
Aluminum	<b>1.09</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>200</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>142</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.05</b>
Barite BaSO4 PTB	<b>0.5</b>
Barite BaSO4 SI	<b>0.97</b>
Calcite CaCO3 PTB	<b>28.2</b>
Calcite CaCO3 SI	<b>1.23</b>
Celestite SrSO4 SI	<b>-1.44</b>
Gypsum CaSO4 SI	<b>-2.67</b>
Hemihydrate CaSO4 SI	<b>-2.43</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34476**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34477**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>5</b>	ppb
pH	<b>7.79</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4148</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10051</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.995</b>	ohms - m
Specific Gravity	<b>1.0052</b>	
Total Dissolved Solids	<b>6508.827</b>	mg/L

Cations	Result	Unit
Iron	<b>75.21</b>	mg/L
Manganese	<b>1.267</b>	mg/L
Barium	<b>0.32</b>	mg/L
Strontium	<b>3.66</b>	mg/L
Calcium	<b>29.02</b>	mg/L
Magnesium	<b>5.12</b>	mg/L
Sodium	<b>1918.23</b>	mg/L
Potassium	<b>88.94</b>	mg/L
Boron	<b>3.27</b>	mg/L
Lithium	<b>3.62</b>	mg/L
Zinc	<b>0.16</b>	mg/L
Lead	<b>0.03</b>	mg/L
Silicon	<b>38.28</b>	mg/L
Aluminum	<b>0.30</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>192</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>136</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.12</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.52</b>
Calcite CaCO3 PTB	<b>21.5</b>
Calcite CaCO3 SI	<b>0.83</b>
Celestite SrSO4 SI	<b>-1.49</b>
Gypsum CaSO4 SI	<b>-2.74</b>
Hemihydrate CaSO4 SI	<b>-2.50</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34477**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34478**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.81</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4184.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10078</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.992</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>6477.048</b>	mg/L

Cations	Result	Unit
Iron	<b>26.30</b>	mg/L
Manganese	<b>0.538</b>	mg/L
Barium	<b>0.14</b>	mg/L
Strontium	<b>2.90</b>	mg/L
Calcium	<b>23.18</b>	mg/L
Magnesium	<b>4.33</b>	mg/L
Sodium	<b>1881.06</b>	mg/L
Potassium	<b>84.93</b>	mg/L
Boron	<b>3.26</b>	mg/L
Lithium	<b>3.57</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>36.54</b>	mg/L
Aluminum	<b>&lt;</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>209</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>145</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.19</b>
Barite BaSO4 PTB	<b>0.0</b>
Barite BaSO4 SI	<b>0.19</b>
Calcite CaCO3 PTB	<b>16.7</b>
Calcite CaCO3 SI	<b>0.76</b>
Celestite SrSO4 SI	<b>-1.57</b>
Gypsum CaSO4 SI	<b>-2.81</b>
Hemihydrate CaSO4 SI	<b>-2.57</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34478**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34479**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.86</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4135.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9956</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.004</b>	ohms - m
Specific Gravity	<b>1.0059</b>	
Total Dissolved Solids	<b>6453.24</b>	mg/L

Cations	Result	Unit
Iron	<b>80.14</b>	mg/L
Manganese	<b>0.960</b>	mg/L
Barium	<b>0.27</b>	mg/L
Strontium	<b>3.41</b>	mg/L
Calcium	<b>25.65</b>	mg/L
Magnesium	<b>4.42</b>	mg/L
Sodium	<b>1872.59</b>	mg/L
Potassium	<b>84.69</b>	mg/L
Boron	<b>3.27</b>	mg/L
Lithium	<b>3.59</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>39.10</b>	mg/L
Aluminum	<b>0.12</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>193</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>137</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.17</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.45</b>
Calcite CaCO3 PTB	<b>19.2</b>
Calcite CaCO3 SI	<b>0.85</b>
Celestite SrSO4 SI	<b>-1.52</b>
Gypsum CaSO4 SI	<b>-2.79</b>
Hemihydrate CaSO4 SI	<b>-2.55</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34479**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34480**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.74</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3904</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9589</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.043</b>	ohms - m
Specific Gravity	<b>1.0057</b>	
Total Dissolved Solids	<b>6187.204</b>	mg/L

Cations	Result	Unit
Iron	<b>49.82</b>	mg/L
Manganese	<b>0.714</b>	mg/L
Barium	<b>0.30</b>	mg/L
Strontium	<b>3.67</b>	mg/L
Calcium	<b>27.57</b>	mg/L
Magnesium	<b>4.44</b>	mg/L
Sodium	<b>1880.69</b>	mg/L
Potassium	<b>84.68</b>	mg/L
Boron	<b>3.26</b>	mg/L
Lithium	<b>3.55</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>40.56</b>	mg/L
Aluminum	<b>0.04</b>	mg/L

Anions	Result	Unit
Chloride	<b>183</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>133</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Celestite SrSO4 SI	<b>-1.47</b>
Gypsum CaSO4 SI	<b>-2.75</b>
Hemihydrate CaSO4 SI	<b>-2.51</b>
Anhydrite CaSO4 SI	<b>-3.14</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.52</b>
Calcite CaCO3 PTB	<b>20.0</b>
Calcite CaCO3 SI	<b>0.77</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34480**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34481**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.69</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4148</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9966</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.003</b>	ohms - m
Specific Gravity	<b>1.0055</b>	
Total Dissolved Solids	<b>6530.814</b>	mg/L

Cations	Result	Unit
Iron	<b>150.64</b>	mg/L
Manganese	<b>1.754</b>	mg/L
Barium	<b>0.44</b>	mg/L
Strontium	<b>3.69</b>	mg/L
Calcium	<b>28.33</b>	mg/L
Magnesium	<b>4.40</b>	mg/L
Sodium	<b>1867.56</b>	mg/L
Potassium	<b>83.42</b>	mg/L
Boron	<b>3.23</b>	mg/L
Lithium	<b>3.49</b>	mg/L
Zinc	<b>0.43</b>	mg/L
Lead	<b>0.05</b>	mg/L
Silicon	<b>41.13</b>	mg/L
Aluminum	<b>0.18</b>	mg/L

Anions	Result	Unit
Chloride	<b>189</b>	mg/L
Fluoride	<b>4</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>137</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L

Scale Type	Result
Calcite CaCO3 SI	<b>0.72</b>
Celestite SrSO4 SI	<b>-1.49</b>
Gypsum CaSO4 SI	<b>-2.75</b>
Anhydrite CaSO4 SI	<b>-3.13</b>
Barite BaSO4 PTB	<b>0.2</b>
Barite BaSO4 SI	<b>0.66</b>
Calcite CaCO3 PTB	<b>19.9</b>
Hemihydrate CaSO4 SI	<b>-2.51</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34481**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34482**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.68</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4221.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10079</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.992</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>6457.957</b>	mg/L

Cations	Result	Unit
Iron	<b>7.20</b>	mg/L
Manganese	<b>0.357</b>	mg/L
Barium	<b>0.24</b>	mg/L
Strontium	<b>3.81</b>	mg/L
Calcium	<b>28.12</b>	mg/L
Magnesium	<b>4.48</b>	mg/L
Sodium	<b>1878.55</b>	mg/L
Potassium	<b>85.56</b>	mg/L
Boron	<b>3.28</b>	mg/L
Lithium	<b>3.58</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>0.01</b>	mg/L
Silicon	<b>41.44</b>	mg/L
Aluminum	<b>&lt;</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>181</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>133</b>	mg/L

Scale Type	Result
Calcite CaCO3 PTB	<b>19.8</b>
Calcite CaCO3 SI	<b>0.72</b>
Celestite SrSO4 SI	<b>-1.48</b>
Gypsum CaSO4 SI	<b>-2.76</b>
Hemihydrate CaSO4 SI	<b>-2.52</b>
Anhydrite CaSO4 SI	<b>-3.15</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.38</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34482**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34483**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.64</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4148</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10012</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.999</b>	ohms - m
Specific Gravity	<b>1.0056</b>	
Total Dissolved Solids	<b>6834.581</b>	mg/L

Cations	Result	Unit
Iron	<b>422.27</b>	mg/L
Manganese	<b>4.671</b>	mg/L
Barium	<b>0.72</b>	mg/L
Strontium	<b>3.96</b>	mg/L
Calcium	<b>33.97</b>	mg/L
Magnesium	<b>4.66</b>	mg/L
Sodium	<b>1894.33</b>	mg/L
Potassium	<b>84.40</b>	mg/L
Boron	<b>3.31</b>	mg/L
Lithium	<b>3.52</b>	mg/L
Zinc	<b>0.81</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>44.36</b>	mg/L
Aluminum	<b>0.37</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>185</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Fluoride	<b>5</b>	mg/L
Sulfate	<b>137</b>	mg/L

Scale Type	Result
Calcite CaCO3 PTB	<b>24.4</b>
Calcite CaCO3 SI	<b>0.75</b>
Celestite SrSO4 SI	<b>-1.46</b>
Anhydrite CaSO4 SI	<b>-3.05</b>
Barite BaSO4 PTB	<b>0.4</b>
Barite BaSO4 SI	<b>0.87</b>
Gypsum CaSO4 SI	<b>-2.67</b>
Hemihydrate CaSO4 SI	<b>-2.43</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34483**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34484**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.61</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4270</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10220</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.978</b>	ohms - m
Specific Gravity	<b>1.0058</b>	
Total Dissolved Solids	<b>6630.839</b>	mg/L

Cations	Result	Unit
Iron	<b>88.77</b>	mg/L
Manganese	<b>1.329</b>	mg/L
Barium	<b>0.37</b>	mg/L
Strontium	<b>3.69</b>	mg/L
Calcium	<b>30.16</b>	mg/L
Magnesium	<b>4.92</b>	mg/L
Sodium	<b>1934.60</b>	mg/L
Potassium	<b>85.04</b>	mg/L
Boron	<b>3.40</b>	mg/L
Lithium	<b>3.56</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>0.08</b>	mg/L
Silicon	<b>39.02</b>	mg/L
Aluminum	<b>0.10</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>169</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>128</b>	mg/L

Scale Type	Result
Barite BaSO4 SI	<b>0.56</b>
Calcite CaCO3 PTB	<b>20.8</b>
Calcite CaCO3 SI	<b>0.68</b>
Celestite SrSO4 SI	<b>-1.52</b>
Anhydrite CaSO4 SI	<b>-3.13</b>
Barite BaSO4 PTB	<b>0.2</b>
Gypsum CaSO4 SI	<b>-2.75</b>
Hemihydrate CaSO4 SI	<b>-2.51</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34484**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34485**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.79</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4074.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9763</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.024</b>	ohms - m
Specific Gravity	<b>1.0054</b>	
Total Dissolved Solids	<b>6299.122</b>	mg/L

Cations	Result	Unit
Iron	<b>49.65</b>	mg/L
Manganese	<b>0.862</b>	mg/L
Barium	<b>0.15</b>	mg/L
Strontium	<b>2.76</b>	mg/L
Calcium	<b>22.96</b>	mg/L
Magnesium	<b>4.21</b>	mg/L
Sodium	<b>1863.73</b>	mg/L
Potassium	<b>81.37</b>	mg/L
Boron	<b>3.37</b>	mg/L
Lithium	<b>3.40</b>	mg/L
Zinc	<b>0.36</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>32.06</b>	mg/L
Aluminum	<b>0.06</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>159</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>121</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.27</b>
Barite BaSO4 PTB	<b>0.0</b>
Barite BaSO4 SI	<b>0.14</b>
Calcite CaCO3 PTB	<b>16.2</b>
Calcite CaCO3 SI	<b>0.72</b>
Celestite SrSO4 SI	<b>-1.66</b>
Gypsum CaSO4 SI	<b>-2.89</b>
Hemihydrate CaSO4 SI	<b>-2.65</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34485**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34486**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.61</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4270</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10107</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.989</b>	ohms - m
Specific Gravity	<b>1.0055</b>	
Total Dissolved Solids	<b>6503.706</b>	mg/L

Cations	Result	Unit
Iron	<b>34.48</b>	mg/L
Manganese	<b>0.606</b>	mg/L
Barium	<b>0.32</b>	mg/L
Strontium	<b>3.79</b>	mg/L
Calcium	<b>29.02</b>	mg/L
Magnesium	<b>4.54</b>	mg/L
Sodium	<b>1861.95</b>	mg/L
Potassium	<b>82.41</b>	mg/L
Boron	<b>3.29</b>	mg/L
Lithium	<b>3.49</b>	mg/L
Zinc	<b>0.20</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>41.51</b>	mg/L
Aluminum	<b>&lt;</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>169</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>130</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.14</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.50</b>
Calcite CaCO3 PTB	<b>19.8</b>
Calcite CaCO3 SI	<b>0.67</b>
Celestite SrSO4 SI	<b>-1.50</b>
Gypsum CaSO4 SI	<b>-2.76</b>
Hemihydrate CaSO4 SI	<b>-2.52</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34486**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34487**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.54</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4050.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9796</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.021</b>	ohms - m
Specific Gravity	<b>1.0042</b>	
Total Dissolved Solids	<b>6275.89</b>	mg/L

Cations	Result	Unit
Iron	<b>6.08</b>	mg/L
Manganese	<b>0.320</b>	mg/L
Barium	<b>0.24</b>	mg/L
Strontium	<b>3.66</b>	mg/L
Calcium	<b>27.26</b>	mg/L
Magnesium	<b>4.32</b>	mg/L
Sodium	<b>1865.61</b>	mg/L
Potassium	<b>82.30</b>	mg/L
Boron	<b>3.29</b>	mg/L
Lithium	<b>3.48</b>	mg/L
Zinc	<b>0.17</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>39.09</b>	mg/L
Aluminum	<b>0.08</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>182</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>136</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.15</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.39</b>
Calcite CaCO3 PTB	<b>16.9</b>
Calcite CaCO3 SI	<b>0.55</b>
Celestite SrSO4 SI	<b>-1.49</b>
Gypsum CaSO4 SI	<b>-2.77</b>
Hemihydrate CaSO4 SI	<b>-2.53</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34487**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34488**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.68</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4160.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9849</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.015</b>	ohms - m
Specific Gravity	<b>1.0051</b>	
Total Dissolved Solids	<b>6312.608</b>	mg/L

Cations	Result	Unit
Iron	<b>9.08</b>	mg/L
Manganese	<b>0.388</b>	mg/L
Barium	<b>0.11</b>	mg/L
Strontium	<b>2.94</b>	mg/L
Calcium	<b>21.62</b>	mg/L
Magnesium	<b>3.85</b>	mg/L
Sodium	<b>1792.42</b>	mg/L
Potassium	<b>79.43</b>	mg/L
Boron	<b>3.23</b>	mg/L
Lithium	<b>3.32</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>34.76</b>	mg/L
Aluminum	<b>0.03</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>188</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>134</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.25</b>
Barite BaSO4 PTB	<b>0.0</b>
Barite BaSO4 SI	<b>0.05</b>
Calcite CaCO3 PTB	<b>14.1</b>
Calcite CaCO3 SI	<b>0.60</b>
Celestite SrSO4 SI	<b>-1.59</b>
Gypsum CaSO4 SI	<b>-2.87</b>
Hemihydrate CaSO4 SI	<b>-2.63</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34488**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34489**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.53</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4099.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9883</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.012</b>	ohms - m
Specific Gravity	<b>1.0053</b>	
Total Dissolved Solids	<b>6340.89</b>	mg/L

Cations	Result	Unit
Iron	<b>15.33</b>	mg/L
Manganese	<b>0.390</b>	mg/L
Barium	<b>0.22</b>	mg/L
Strontium	<b>3.56</b>	mg/L
Calcium	<b>26.09</b>	mg/L
Magnesium	<b>4.20</b>	mg/L
Sodium	<b>1871.90</b>	mg/L
Potassium	<b>82.59</b>	mg/L
Boron	<b>3.36</b>	mg/L
Lithium	<b>3.49</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>39.00</b>	mg/L
Aluminum	<b>0.05</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>187</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>133</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.18</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.35</b>
Calcite CaCO3 PTB	<b>15.9</b>
Calcite CaCO3 SI	<b>0.52</b>
Celestite SrSO4 SI	<b>-1.51</b>
Gypsum CaSO4 SI	<b>-2.79</b>
Hemihydrate CaSO4 SI	<b>-2.56</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34489**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34490**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.99</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4233.4</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10024</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.998</b>	ohms - m
Specific Gravity	<b>1.0052</b>	
Total Dissolved Solids	<b>6437.996</b>	mg/L

Cations	Result	Unit
Iron	<b>22.19</b>	mg/L
Manganese	<b>0.446</b>	mg/L
Barium	<b>0.17</b>	mg/L
Strontium	<b>3.04</b>	mg/L
Calcium	<b>22.37</b>	mg/L
Magnesium	<b>3.82</b>	mg/L
Sodium	<b>1831.56</b>	mg/L
Potassium	<b>80.30</b>	mg/L
Boron	<b>3.30</b>	mg/L
Lithium	<b>3.39</b>	mg/L
Zinc	<b>0.13</b>	mg/L
Lead	<b>0.13</b>	mg/L
Silicon	<b>36.29</b>	mg/L
Aluminum	<b>&lt;</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>191</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>130</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.25</b>
Barite BaSO4 PTB	<b>0.0</b>
Barite BaSO4 SI	<b>0.23</b>
Calcite CaCO3 PTB	<b>17.2</b>
Calcite CaCO3 SI	<b>0.93</b>
Celestite SrSO4 SI	<b>-1.59</b>
Gypsum CaSO4 SI	<b>-2.87</b>
Hemihydrate CaSO4 SI	<b>-2.63</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34490**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34491**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.63</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4123.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9869</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.013</b>	ohms - m
Specific Gravity	<b>1.0051</b>	
Total Dissolved Solids	<b>6320.648</b>	mg/L

Cations	Result	Unit
Iron	<b>4.17</b>	mg/L
Manganese	<b>0.298</b>	mg/L
Barium	<b>0.06</b>	mg/L
Strontium	<b>1.92</b>	mg/L
Calcium	<b>11.65</b>	mg/L
Magnesium	<b>3.46</b>	mg/L
Sodium	<b>1852.49</b>	mg/L
Potassium	<b>80.76</b>	mg/L
Boron	<b>3.33</b>	mg/L
Lithium	<b>3.29</b>	mg/L
Zinc	<b>0.02</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>32.05</b>	mg/L
Aluminum	<b>0.01</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>190</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>133</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.52</b>
Barite BaSO4 SI	<b>-0.21</b>
Calcite CaCO3 PTB	<b>4.8</b>
Calcite CaCO3 SI	<b>0.28</b>
Celestite SrSO4 SI	<b>-1.78</b>
Gypsum CaSO4 SI	<b>-3.14</b>
Hemihydrate CaSO4 SI	<b>-2.90</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34492**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>6</b>	ppb
pH	<b>7.68</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>3952.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9643</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.037</b>	ohms - m
Specific Gravity	<b>1.0053</b>	
Total Dissolved Solids	<b>6184.22</b>	mg/L

Cations	Result	Unit
Iron	<b>11.98</b>	mg/L
Manganese	<b>0.480</b>	mg/L
Barium	<b>0.09</b>	mg/L
Strontium	<b>2.83</b>	mg/L
Calcium	<b>22.43</b>	mg/L
Magnesium	<b>4.12</b>	mg/L
Sodium	<b>1871.49</b>	mg/L
Potassium	<b>82.01</b>	mg/L
Boron	<b>3.25</b>	mg/L
Lithium	<b>3.51</b>	mg/L
Zinc	<b>0.13</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>35.47</b>	mg/L
Aluminum	<b>0.02</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>187</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>131</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.23</b>
Barite BaSO4 SI	<b>-0.01</b>
Calcite CaCO3 PTB	<b>14.9</b>
Calcite CaCO3 SI	<b>0.63</b>
Celestite SrSO4 SI	<b>-1.59</b>
Gypsum CaSO4 SI	<b>-2.85</b>
Hemihydrate CaSO4 SI	<b>-2.60</b>

Saturation Index Calculation (Tomson-Oddo Model)

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34493**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.66</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4062.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9791</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.021</b>	ohms - m
Specific Gravity	<b>1.0058</b>	
Total Dissolved Solids	<b>6289.011</b>	mg/L

Cations	Result	Unit
Iron	<b>22.00</b>	mg/L
Manganese	<b>0.531</b>	mg/L
Barium	<b>0.23</b>	mg/L
Strontium	<b>3.58</b>	mg/L
Calcium	<b>30.42</b>	mg/L
Magnesium	<b>11.91</b>	mg/L
Sodium	<b>1836.74</b>	mg/L
Potassium	<b>93.41</b>	mg/L
Boron	<b>3.28</b>	mg/L
Lithium	<b>3.50</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>0.06</b>	mg/L
Silicon	<b>40.23</b>	mg/L
Aluminum	<b>0.05</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>188</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>133</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.12</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.36</b>
Calcite CaCO3 PTB	<b>21.4</b>
Calcite CaCO3 SI	<b>0.72</b>
Celestite SrSO4 SI	<b>-1.52</b>
Gypsum CaSO4 SI	<b>-2.73</b>
Hemihydrate CaSO4 SI	<b>-2.49</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34493**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34494**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.63</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4148</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9945</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.006</b>	ohms - m
Specific Gravity	<b>1.0054</b>	
Total Dissolved Solids	<b>6387.944</b>	mg/L

Cations	Result	Unit
Iron	<b>22.62</b>	mg/L
Manganese	<b>0.424</b>	mg/L
Barium	<b>0.20</b>	mg/L
Strontium	<b>3.31</b>	mg/L
Calcium	<b>21.16</b>	mg/L
Magnesium	<b>4.14</b>	mg/L
Sodium	<b>1871.09</b>	mg/L
Potassium	<b>81.62</b>	mg/L
Boron	<b>3.25</b>	mg/L
Lithium	<b>3.50</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>0.01</b>	mg/L
Silicon	<b>38.77</b>	mg/L
Aluminum	<b>0.01</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>187</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>130</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.28</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.30</b>
Calcite CaCO3 PTB	<b>13.2</b>
Calcite CaCO3 SI	<b>0.54</b>
Celestite SrSO4 SI	<b>-1.55</b>
Gypsum CaSO4 SI	<b>-2.89</b>
Hemihydrate CaSO4 SI	<b>-2.65</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34494**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34495**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>8.36</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>2379</b>	mg/L
Carbonate	<b>1140</b>	mg/L
Conductivity (Calculated)	<b>7118</b>	µS - cm3
Ionic Strength	<b>0.07</b>	
Resistivity	<b>1.405</b>	ohms - m
Specific Gravity	<b>1.0052</b>	
Total Dissolved Solids	<b>4580.435</b>	mg/L

Cations	Result	Unit
Iron	<b>24.50</b>	mg/L
Manganese	<b>0.395</b>	mg/L
Barium	<b>0.20</b>	mg/L
Strontium	<b>3.04</b>	mg/L
Calcium	<b>19.14</b>	mg/L
Magnesium	<b>4.05</b>	mg/L
Sodium	<b>1841.11</b>	mg/L
Potassium	<b>80.18</b>	mg/L
Boron	<b>3.24</b>	mg/L
Lithium	<b>3.42</b>	mg/L
Zinc	<b>0.24</b>	mg/L
Lead	<b>0.13</b>	mg/L
Silicon	<b>36.58</b>	mg/L
Aluminum	<b>0.05</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>182</b>	mg/L
Fluoride	<b>4</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>127</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.27</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.42</b>
Calcite CaCO3 PTB	<b>15.4</b>
Calcite CaCO3 SI	<b>1.10</b>
Celestite SrSO4 SI	<b>-1.51</b>
Gypsum CaSO4 SI	<b>-2.89</b>
Hemihydrate CaSO4 SI	<b>-2.63</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34495**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34496**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.6</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4343.2</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10194</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.981</b>	ohms - m
Specific Gravity	<b>1.0053</b>	
Total Dissolved Solids	<b>6539.485</b>	mg/L

Cations	Result	Unit
Iron	<b>14.80</b>	mg/L
Manganese	<b>0.305</b>	mg/L
Barium	<b>0.34</b>	mg/L
Strontium	<b>3.93</b>	mg/L
Calcium	<b>27.60</b>	mg/L
Magnesium	<b>4.29</b>	mg/L
Sodium	<b>1846.02</b>	mg/L
Potassium	<b>80.88</b>	mg/L
Boron	<b>3.21</b>	mg/L
Lithium	<b>3.47</b>	mg/L
Zinc	<b>0.22</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>41.35</b>	mg/L
Aluminum	<b>0.05</b>	mg/L

Anions	Result	Unit
Chloride	<b>174</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>125</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Celestite SrSO4 SI	<b>-1.50</b>
Gypsum CaSO4 SI	<b>-2.80</b>
Hemihydrate CaSO4 SI	<b>-2.56</b>
Anhydrite CaSO4 SI	<b>-3.18</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.51</b>
Calcite CaCO3 PTB	<b>18.5</b>
Calcite CaCO3 SI	<b>0.64</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34496**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34497**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.45</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4184.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10002</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.000</b>	ohms - m
Specific Gravity	<b>1.0052</b>	
Total Dissolved Solids	<b>6435.424</b>	mg/L

Cations	Result	Unit
Iron	<b>33.68</b>	mg/L
Manganese	<b>0.554</b>	mg/L
Barium	<b>0.15</b>	mg/L
Strontium	<b>2.96</b>	mg/L
Calcium	<b>20.67</b>	mg/L
Magnesium	<b>3.93</b>	mg/L
Sodium	<b>1879.88</b>	mg/L
Potassium	<b>81.72</b>	mg/L
Boron	<b>3.45</b>	mg/L
Lithium	<b>3.45</b>	mg/L
Zinc	<b>0.15</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>35.83</b>	mg/L
Aluminum	<b>0.04</b>	mg/L

Anions	Result	Unit
Chloride	<b>182</b>	mg/L
Fluoride	<b>4</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>127</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L

Scale Type	Result
Calcite CaCO3 SI	<b>0.35</b>
Celestite SrSO4 SI	<b>-1.61</b>
Gypsum CaSO4 SI	<b>-2.91</b>
Anhydrite CaSO4 SI	<b>-3.30</b>
Barite BaSO4 PTB	<b>0.0</b>
Barite BaSO4 SI	<b>0.16</b>
Calcite CaCO3 PTB	<b>9.9</b>
Hemihydrate CaSO4 SI	<b>-2.67</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34497**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34498**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.57</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4270</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10056</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.994</b>	ohms - m
Specific Gravity	<b>1.0055</b>	
Total Dissolved Solids	<b>6456.311</b>	mg/L

Cations	Result	Unit
Iron	<b>20.34</b>	mg/L
Manganese	<b>0.441</b>	mg/L
Barium	<b>0.18</b>	mg/L
Strontium	<b>3.31</b>	mg/L
Calcium	<b>23.34</b>	mg/L
Magnesium	<b>3.96</b>	mg/L
Sodium	<b>1828.74</b>	mg/L
Potassium	<b>80.27</b>	mg/L
Boron	<b>3.37</b>	mg/L
Lithium	<b>3.43</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>0.02</b>	mg/L
Silicon	<b>37.42</b>	mg/L
Aluminum	<b>&lt;</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>179</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>127</b>	mg/L

Scale Type	Result
Calcite CaCO3 PTB	<b>14.4</b>
Calcite CaCO3 SI	<b>0.53</b>
Celestite SrSO4 SI	<b>-1.56</b>
Anhydrite CaSO4 SI	<b>-3.24</b>
Barite BaSO4 PTB	<b>0.0</b>
Barite BaSO4 SI	<b>0.24</b>
Gypsum CaSO4 SI	<b>-2.86</b>
Hemihydrate CaSO4 SI	<b>-2.62</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34498**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34499**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.41</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4184.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10005</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.000</b>	ohms - m
Specific Gravity	<b>1.0042</b>	
Total Dissolved Solids	<b>6426.555</b>	mg/L

Cations	Result	Unit
Iron	<b>22.81</b>	mg/L
Manganese	<b>0.455</b>	mg/L
Barium	<b>0.18</b>	mg/L
Strontium	<b>3.40</b>	mg/L
Calcium	<b>23.57</b>	mg/L
Magnesium	<b>4.03</b>	mg/L
Sodium	<b>1879.51</b>	mg/L
Potassium	<b>81.95</b>	mg/L
Boron	<b>3.34</b>	mg/L
Lithium	<b>3.49</b>	mg/L
Zinc	<b>0.11</b>	mg/L
Lead	<b>0.04</b>	mg/L
Silicon	<b>39.02</b>	mg/L
Aluminum	<b>0.06</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>179</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>129</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Calcite CaCO3 PTB	<b>11.8</b>
Calcite CaCO3 SI	<b>0.37</b>
Celestite SrSO4 SI	<b>-1.55</b>
Anhydrite CaSO4 SI	<b>-3.23</b>
Barite BaSO4 PTB	<b>0.0</b>
Barite BaSO4 SI	<b>0.25</b>
Gypsum CaSO4 SI	<b>-2.85</b>
Hemihydrate CaSO4 SI	<b>-2.61</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34499**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34500**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.58</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4148</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9941</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.006</b>	ohms - m
Specific Gravity	<b>1.0054</b>	
Total Dissolved Solids	<b>6412.345</b>	mg/L

Cations	Result	Unit
Iron	<b>49.49</b>	mg/L
Manganese	<b>0.545</b>	mg/L
Barium	<b>0.19</b>	mg/L
Strontium	<b>2.57</b>	mg/L
Calcium	<b>14.41</b>	mg/L
Magnesium	<b>3.46</b>	mg/L
Sodium	<b>1887.68</b>	mg/L
Potassium	<b>82.32</b>	mg/L
Boron	<b>3.58</b>	mg/L
Lithium	<b>3.41</b>	mg/L
Zinc	<b>&lt;</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>35.61</b>	mg/L
Aluminum	<b>0.02</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Chloride	<b>179</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>127</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.45</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.27</b>
Calcite CaCO3 PTB	<b>6.5</b>
Calcite CaCO3 SI	<b>0.32</b>
Celestite SrSO4 SI	<b>-1.67</b>
Gypsum CaSO4 SI	<b>-3.07</b>
Hemihydrate CaSO4 SI	<b>-2.83</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34500**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/14/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34501**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.5</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4440.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10384</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.963</b>	ohms - m
Specific Gravity	<b>1.0044</b>	
Total Dissolved Solids	<b>6726.524</b>	mg/L

Cations	Result	Unit
Iron	<b>79.96</b>	mg/L
Manganese	<b>1.014</b>	mg/L
Barium	<b>0.40</b>	mg/L
Strontium	<b>4.00</b>	mg/L
Calcium	<b>28.18</b>	mg/L
Magnesium	<b>4.26</b>	mg/L
Sodium	<b>1864.91</b>	mg/L
Potassium	<b>82.45</b>	mg/L
Boron	<b>3.33</b>	mg/L
Lithium	<b>3.52</b>	mg/L
Zinc	<b>0.29</b>	mg/L
Lead	<b>&lt;</b>	mg/L
Silicon	<b>42.57</b>	mg/L
Aluminum	<b>0.11</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Chloride	<b>178</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>125</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.17</b>
Barite BaSO4 PTB	<b>0.2</b>
Barite BaSO4 SI	<b>0.58</b>
Calcite CaCO3 PTB	<b>17.7</b>
Calcite CaCO3 SI	<b>0.56</b>
Celestite SrSO4 SI	<b>-1.49</b>
Gypsum CaSO4 SI	<b>-2.79</b>
Hemihydrate CaSO4 SI	<b>-2.55</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34501**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
--

## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34502**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>10</b>	ppb
pH	<b>7.47</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4123.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9896</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.011</b>	ohms - m
Specific Gravity	<b>1.0052</b>	
Total Dissolved Solids	<b>6346.937</b>	mg/L

Cations	Result	Unit
Iron	<b>13.08</b>	mg/L
Manganese	<b>0.347</b>	mg/L
Barium	<b>0.27</b>	mg/L
Strontium	<b>3.66</b>	mg/L
Calcium	<b>25.92</b>	mg/L
Magnesium	<b>4.06</b>	mg/L
Sodium	<b>1865.00</b>	mg/L
Potassium	<b>81.30</b>	mg/L
Boron	<b>3.29</b>	mg/L
Lithium	<b>3.45</b>	mg/L
Zinc	<b>0.15</b>	mg/L
Lead	<b>0.12</b>	mg/L
Silicon	<b>39.84</b>	mg/L
Aluminum	<b>0.03</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Chloride	<b>182</b>	mg/L
Fluoride	<b>4</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Sulfate	<b>129</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.19</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.42</b>
Calcite CaCO3 PTB	<b>14.7</b>
Hemihydrate CaSO4 SI	<b>-2.57</b>
Calcite CaCO3 SI	<b>0.46</b>
Celestite SrSO4 SI	<b>-1.51</b>
Gypsum CaSO4 SI	<b>-2.81</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34502**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34503**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>8</b>	ppb
pH	<b>7.49</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4123.6</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>10083</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>0.992</b>	ohms - m
Specific Gravity	<b>1.0051</b>	
Total Dissolved Solids	<b>6485.585</b>	mg/L

Cations	Result	Unit
Iron	<b>32.22</b>	mg/L
Manganese	<b>0.495</b>	mg/L
Barium	<b>0.21</b>	mg/L
Strontium	<b>3.22</b>	mg/L
Calcium	<b>20.81</b>	mg/L
Magnesium	<b>4.04</b>	mg/L
Sodium	<b>1982.99</b>	mg/L
Potassium	<b>86.02</b>	mg/L
Boron	<b>3.56</b>	mg/L
Lithium	<b>3.56</b>	mg/L
Zinc	<b>0.31</b>	mg/L
Lead	<b>0.14</b>	mg/L
Silicon	<b>39.71</b>	mg/L
Aluminum	<b>0.06</b>	mg/L

Anions	Result	Unit
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>187</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L
Fluoride	<b>4</b>	mg/L
Sulfate	<b>131</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.28</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.32</b>
Calcite CaCO3 PTB	<b>10.7</b>
Calcite CaCO3 SI	<b>0.39</b>
Celestite SrSO4 SI	<b>-1.56</b>
Gypsum CaSO4 SI	<b>-2.90</b>
Hemihydrate CaSO4 SI	<b>-2.66</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34503**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)
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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34504**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

Customer: **Sandridge Energy (1505453)**

Region: **North Park**

Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Analyses	Result	Unit
Dissolved CO2	<b>Not Detected</b>	mg/L
Dissolved H2S	<b>1</b>	mg/L
Oxygen	<b>12</b>	ppb
pH	<b>7.44</b>	
Pressure	<b>1</b>	psi
Temperature	<b>72</b>	° F

Analyses	Result	Unit
Bicarbonate	<b>4074.8</b>	mg/L
Carbonate	<b>Not Detected</b>	mg/L
Conductivity (Calculated)	<b>9993</b>	µS - cm3
Ionic Strength	<b>0.08</b>	
Resistivity	<b>1.001</b>	ohms - m
Specific Gravity	<b>1.0053</b>	
Total Dissolved Solids	<b>6457.31</b>	mg/L

Cations	Result	Unit
Iron	<b>61.03</b>	mg/L
Manganese	<b>0.83</b>	mg/L
Barium	<b>0.22</b>	mg/L
Strontium	<b>3.14</b>	mg/L
Calcium	<b>21.43</b>	mg/L
Magnesium	<b>4.01</b>	mg/L
Sodium	<b>1970.85</b>	mg/L
Potassium	<b>85.58</b>	mg/L
Boron	<b>3.83</b>	mg/L
Lithium	<b>3.55</b>	mg/L
Zinc	<b>0.39</b>	mg/L
Lead	<b>0.12</b>	mg/L
Silicon	<b>39.97</b>	mg/L
Aluminum	<b>0.08</b>	mg/L

Anions	Result	Unit
Fluoride	<b>4</b>	mg/L
Sulfate	<b>131</b>	mg/L
Bromide	<b>Not Detected</b>	mg/L
Chloride	<b>190</b>	mg/L
Nitrate	<b>Not Detected</b>	mg/L
Phosphate	<b>Not Detected</b>	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	<b>-3.27</b>
Barite BaSO4 PTB	<b>0.1</b>
Barite BaSO4 SI	<b>0.34</b>
Gypsum CaSO4 SI	<b>-2.88</b>
Hemihydrate CaSO4 SI	<b>-2.65</b>
Calcite CaCO3 PTB	<b>10.1</b>
Calcite CaCO3 SI	<b>0.34</b>
Celestite SrSO4 SI	<b>-1.57</b>

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## Water Analysis Report

Attention: **Sidney.shuck@nalco.com**

Location Code: **354156**

Sample ID: **AJ34504**

Login Batch: **2017-09-13-001**

Collection Date: **09/05/2017**

Receive Date: **09/13/2017**

Report Date: **09/15/2017**

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Location: **Big Horn 0780 1-17 SWD**

System: **SWD**

Equipment: **SWAB**

Lab ID: **ABU-0021**

Sample Point: **SWAB**

Saturation Index Calculation (Tomson-Oddo Model)

### Comments

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