

Appendix C-1
Well Completion Diagrams

POWERTECH WELL AND PUMP DATA

Location of Well Burdock, SD	Drilling Contractor Davis Drilling	Driller Tony	Well Name DB07-11-11C
County Fall River	Type of Rig	Drilling Fluid mud	Well Depth 436'
LAT 4811660N	LONG 583455E	Elevation 4163'	Datum point from which all measurements are taken

Screened Monitoring Well Completion Detail

Screened Well No. _____

A. Stick-up Length 2.0'

B. Key No. NA

C. Protective Casing
 Diameter NA
 Material NA
 Length NA
 Depth to Bottom NA

D. Surface Completion
 Diameter NA
 Depth NA
 Material NA

E. Well Casing Data
 Diameter 6" ID
 Material PVC
 Length 428'
 Weight SCH 40
 Depth to Bottom 426'

F. Grout cement Date 10/30/07
 Depth to Top 0'
 Depth to Bottom 427'
 Material sulfate resis. cement
 Density 15.2b/gal
 Volume 24.1 bbls
 % Excess 50
 Method of Installation displacement
 Depth to Cement in Casing 396'
 Return Constant Yes No
 Volume of Grout Return 0

G. Borehole Diameter
 Drilling Dates 6.5" 10/10/07

H. Pack Type/Size NA Date NA
 Depth to Top NA
 Depth to Bottom _____
 Material _____
 Method of Installation _____
 Gradation _____

I. Screen Date 12/18/08
 Depth to Top 426-436'
 Depth to Bottom _____
 Manufacturer _____
 Material PVC
 Slot .01"

J. Bottom Cap
 Material PVC
 Length 1"
 Driller Tony

Boring Depth 495'TD 418' casing'

Method of Drilling Date: 10/10/07

Cabel Tool Hollow Rod
 Direct Rotary Air Rotary
 Bucket Auger Reverse Rotary
 Flight Auger Jetted
 Dug Driven
 Other mud rotary

Use

Domestic Public Supply
 Industrial Irrigation
 Municipal Commercial
 Test Well Heating or Cooling
 Monitoring
 Other _____

One well volume (V) = _____ gallons

Initial Development Water

Water Level (TIC) _____
 Well Depth _____
 Color _____
 Odor _____
 Clarity _____
 Developed By _____
 Date _____
 Well Development Date _____
 Description of Development Technique _____

Pump

Date Installed _____ Type _____
 Manufacturer _____ Model No. _____
 H.P. _____ Volts _____
 Capacity _____
 Depth of Pump Intake Setting _____
 No. of Stages _____
 Oil Water Lubrication

Power Source _____
 Material of drop pipe _____
 Bowls _____
 Shafting _____ Impellers _____
 Bowl Diameter _____
 Column Pipe Diameter _____ Length _____
 Modification _____

Geophysical Logs Run Gamma, Resistivity, SP, ran 10/10/07

Additional Information _____

*****Mechanical Integrity Test*****

PSI Increments _____ Calibration Date of Gage _____
 PSI Full Scale _____
 Test Run By Stan Davis, Len Eakin Date Test Run 12/13/08
 Time Beginning of Test 0900 Time End of Test 1100
 Initial Pressure 35.0PSIG Initial Fluid Level 5.0 inches

Final Pressure 35.0PSIG Final Fluid Level 5.0inches

Water Quality

Sample taken? Yes No
 Where analyzed? _____

Date well completed 12/18/08

POWERTECH WELL AND PUMP DATA

Location of Well Burdock, SD	Drilling Contractor Davis Drilling	Driller Tony	Well Name DB07-11-14C
County Fall River	Type of Rig	Drilling Fluid mud	Well Depth 423'
LAT 4811591N	LONG 583496E	Elevation 3645'	Datum point from which all measurements are taken

Screened Monitoring Well Completion Detail

Screened Well No. _____

A. Stick-up Length 2.0'

B. Key No. NA

C. Protective Casing
 Diameter NA
 Material NA
 Length NA
 Depth to Bottom NA

D. Surface Completion
 Diameter NA
 Depth NA
 Material NA

E. Well Casing Data
 Diameter 4" ID
 Material PVC
 Length 415'
 Weight SCH 40
 Depth to Bottom 413'

F. Grout cement Date 11/3/07
 Depth to Top 0'
 Depth to Bottom 414'
 Material sulfate resis. cement
 Density 15.2b/gal
 Volume 15.8 bbls
 % Excess 50
 Method of Installation displacement
 Depth to Cement in Casing 303'
 Return Constant Yes No
 Volume of Grout Return 0

G. Borehole Diameter
 Drilling Dates 6.25" 11/2/07

H. Pack Type/Size NA Date NA
 Depth to Top NA
 Depth to Bottom _____
 Material _____
 Method of Installation _____
 Gradation _____

I. Screen Date 2/13/08
 Depth to Top 413-423'
 Depth to Bottom _____
 Manufacturer _____
 Material PVC
 Slot .01"

J. Bottom Cap
 Material PVC
 Length 1"
 Driller Tony

Boring Depth 460"TD 415' ream'

Method of Drilling Date: 11/2/07

Cabel Tool Hollow Rod
 Direct Rotary Air Rotary
 Bucket Auger Reverse Rotary
 Flight Auger Jetted
 Dug Driven
 Other mud rotary

Use

Domestic Public Supply
 Industrial Irrigation
 Municipal Commercial
 Test Well Heating or Cooling
 Monitoring
 Other _____

One well volume (V) = _____ gallons

Initial Development Water
 Water Level (TIC) _____
 Well Depth _____
 Color _____
 Odor _____
 Clarity _____
 Developed By _____
 Date _____
 Well Development Date _____
 Description of Development Technique _____

Pump

Date Installed _____ Type _____
 Manufacturer _____ Model No. _____
 H.P. _____ Volts _____
 Capacity _____
 Depth of Pump Intake Setting _____
 No. of Stages _____
 Oil Water Lubrication

Power Source _____
 Material of drop pipe _____
 Bowls _____
 Shafting _____ Impellers _____
 Bowl Diameter _____
 Column Pipe Diameter _____ Length _____
 Modification _____

Geophysical Logs Run Gamma, Resistivity, SP, ran 11/2/07

Additional Information _____

*****Mechanical Integrity Test*****

PSI Increments _____ Calibration Date of Gage _____
 PSI Full Scale _____
 Test Run By Stan Davis, Len Eakin Date Test Run 2/12/08
 Time Beginning of Test 1400 Time End of Test 1445
 Initial Pressure 40.0PSIG Initial Fluid Level 5.0 inches

Final Pressure 40.0PSIG Final Fluid Level 5.0inches

Water Quality
 Sample taken? Yes No
 Where analyzed? _____

Date well completed 2/13/08

POWERTECH WELL AND PUMP DATA

Location of Well Burdock, SD	Drilling Contractor Davis Drilling	Driller Tony	Well Name DB07-11-15
County Fall River	Type of Rig	Drilling Fluid mud	Well Depth 428'
LAT 4811590N	LONG 583428E	Elevation 3710'	Datum point from which all measurements are taken

Screened Monitoring Well Completion Detail

Screened Well No. _____

A. Stick-up Length 2.0'

B. Key No. NA

C. Protective Casing
 Diameter NA
 Material NA
 Length NA
 Depth to Bottom NA

D. Surface Completion
 Diameter NA
 Depth NA
 Material NA

E. Well Casing Data
 Diameter 4" ID
 Material PVC
 Length 420'
 Weight SCH 40
 Depth to Bottom 418'

F. Grout cement Date 11/5/07
 Depth to Top 0'
 Depth to Bottom 419'
 Material sulfate resis. cement
 Density 15.2b/gal
 Volume 15.7 bbls
 % Excess 50
 Method of Installation displacement
 Depth to Cement in Casing 290'
 Return Constant Yes No
 Volume of Grout Return 0

G. Borehole Diameter
 Drilling Dates 6.5" 11/4/07

H. Pack Type/Size NA Date NA
 Depth to Top NA
 Depth to Bottom _____
 Material _____
 Method of Installation _____
 Gradation _____

I. Screen Date 2/24/08
 Depth to Top 418-428'
 Depth to Bottom _____
 Manufacturer _____
 Material PVC
 Slot .01"

J. Bottom Cap
 Material PVC
 Length 1"
 Driller Tony

Boring Depth 495'TD 418' casing'

Additional Information _____

*****Mechanical Integrity Test*****

PSI Increments		Calibration Date of Gage	
PSI Full Scale			
Test Run By	Stan Davis, Len Eakin	Date Test Run	2/9/08
Time Beginning of Test	0930	Time End of Test	1015
Initial Pressure	40.0PSIG	Initial Fluid Level	5.0 inches
Final Pressure	40.0PSIG	Final Fluid Level	5.0inches

Method of Drilling Date: 11/4/07

Cabel Tool Hollow Rod
 Direct Rotary Air Rotary
 Bucket Auger Reverse Rotary
 Flight Auger Jetted
 Dug Driven
 Other mud rotary

Use

Domestic Public Supply
 Industrial Irrigation
 Municipal Commercial
 Test Well Heating or Cooling
 Monitoring
 Other _____

One well volume (V) = _____ gallons

Initial Development Water

Water Level (TIC) _____
 Well Depth _____
 Color _____
 Odor _____
 Clarity _____
 Developed By _____
 Date _____
 Well Development Date _____
 Description of Development Technique _____

Pump

Date Installed _____ Type _____
 Manufacturer _____ Model No. _____
 H.P. _____ Volts _____
 Capacity _____
 Depth of Pump Intake Setting _____
 No. of Stages _____
 Oil Water Lubrication

Power Source _____
 Material of drop pipe _____
 Bowls _____
 Shafting _____ Impellers _____
 Bowl Diameter _____
 Column Pipe Diameter _____ Length _____
 Modification _____

Geophysical Logs Run Gamma, Resistivity, SP, ran 11/4/07

Water Quality

Sample taken? Yes No
 Where analyzed? _____

Date well completed 2/24/08

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POWERTECH WELL AND PUMP DATA

Location of Well Dewey, SD	Drilling Contractor Davis Drilling	Driller Tony	Well Name DB08-11-17
County Fall River	Type of Rig Speed Star 1500	Drilling Fluid Mud	Well Depth 255'
LAT 4811660N	LONG 583440E	Elevation ?	Datum point from which all measurements are taken

Screened Monitoring Well Completion Detail

Screened Well No. _____

A. Stick-up Length 2.0'

B. Key No. NA

C. Protective Casing
 Diameter NA
 Material NA
 Length NA
 Depth to Bottom NA

D. Surface Completion
 Diameter NA
 Depth NA
 Material NA

E. Well Casing Data
 Diameter 6" ID
 Material PVC
 Length 247'
 Weight SDR17
 Depth to Bottom 245'

F. Grout Cement Date 03/26/08
 Depth to Top 0'
 Depth to Bottom 247'
 Material Type V "LA" Cement
 Density 15.2 lb/gal
 Volume 10.05 bbls
 % Excess 10
 Method of Installation Displacement
 Depth to Cement in Casing 2'
 Return Constant Yes No
 Volume of Grout Return 2.5 bbls

G. Borehole Diameter
 Drilling Dates 8.75" 03/26/08

H. Pack Type/Size NA Date NA
 Depth to Top NA
 Depth to Bottom _____
 Material _____
 Method of Installation _____
 Gradation _____

I. Screen Date 04/01/08
 Depth to Top 245-255'
 Depth to Bottom _____
 Manufacturer _____
 Material PVC
 Slot .01"

J. Bottom Cap
 Material PVC
 Length 1"
 Driller Tommy

Boring Depth 257'

Additional Information _____

*****Mechanical Integrity Test*****

PSI Increments	Stan Davis, Dan Tschopp	Date Test Run	04/01/08
PSI Full Scale		Time End of Test	0930
Test Run By		Initial Fluid Level	4 inches
Time Beginning of Test	0830	Final Fluid Level	4inches
Initial Pressure	35.0 PSIG		
Final Pressure	35.0 PSIG		

Method of Drilling _____ Date: 03/25/08

Cabel Tool Hollow Rod
 Direct Rotary Air Rotary
 Bucket Auger Reverse Rotary
 Flight Auger Jetted
 Dug Driven
 Other Mud Rotary

Use
 Domestic Public Supply
 Industrial Irrigation
 Municipal Commercial
 Test Well Heating or Cooling
 Monitoring
 Other _____

One well volume (V) = _____ gallons

Initial Development Water
 Water Level (TIC) 38.08 ft below ground surface
 Well Depth _____
 Color _____
 Odor _____
 Clarity _____
 Developed By _____
 Date _____
 Well Development Date _____
 Description of Development Technique _____

Pump
 Date Installed _____ Type _____
 Manufacturer _____ Model No. _____
 H.P. _____ Volts _____
 Capacity _____
 Depth of Pump Intake Setting _____
 No. of Stages _____
 Oil Water Lubrication

Power Source _____
 Material of drop pipe _____
 Bowls _____
 Shafting _____ Impellers _____
 Bowl Diameter _____
 Column Pipe Diameter _____ Length _____
 Modification _____

Geophysical Logs Run Gamma, Resistivity, SP

Water Quality
 Sample taken? Yes No
 Where analyzed? _____

Date well completed 04/01/08

POWERTECH WELL AND PUMP DATA

Location of Well Dewey, SD	Drilling Contractor Davis Drilling	Driller Tony	Well Name DB08-11-18
County Fall River	Type of Rig Speed Star 1500	Drilling Fluid Mud	Well Depth 631'
LAT 583471N	LONG 4811660E	Elevation 3791'	Datum point from which all measurements are taken

Screened Monitoring Well Completion Detail

Screened Well No. _____

A. Stick-up Length 2.0'

B. Key No. NA

C. Protective Casing
Diameter NA
Material NA
Length NA
Depth to Bottom NA

D. Surface Completion
Diameter NA
Depth NA
Material NA

E. Well Casing Data
Diameter 6" ID
Material Steel
Length 623'
Weight Schedule 40
Depth to Bottom 621'

F. Grout Cement Date 04/02/08
Depth to Top 0'
Depth to Bottom 623'
Material Type V "LA" Cement
Density 15.15 lb/gal
Volume 23.14 bbls
% Excess 10
Method of Installation Displacement
Depth to Cement in Casing 490'
Return Constant Yes No
Volume of Grout Return 1 bbls

G. Borehole Diameter
Drilling Dates 8.75" 03/31/08

H. Pack Type/Size NA Date NA
Depth to Top NA
Depth to Bottom _____
Material _____
Method of Installation _____
Gradation _____

I. Screen Date 04/15/08
Depth to Top 621 to 631'
Depth to Bottom _____
Manufacturer _____
Material PVC
Slot .01"

J. Bottom Cap
Material PVC
Length 1"
Driller Tommy
Boring Depth 633'

Additional Information _____

*****Mechanical Integrity Test*****

PSI Increments	5	Calibration Date of Gage	
PSI Full Scale			
Test Run By	Stan Davis, Dan Tschopp	Date Test Run	04/14/08
Time Beginning of Test	1200	Time End of Test	1300
Initial Pressure	35.0 PSIG	Initial Fluid Level	4 inches
Final Pressure	35.0 PSIG	Final Fluid Level	4 inches

Method of Drilling _____ Date: 04/01/08

Cabel Tool Hollow Rod
 Direct Rotary Air Rotary
 Bucket Auger Reverse Rotary
 Flight Auger Jetted
 Dug Driven
 Other Mud Rotary

Use

Domestic Public Supply
 Industrial Irrigation
 Municipal Commercial
 Test Well Heating or Cooling
 Monitoring
 Other _____

One well volume (V) = _____ gallons

Initial Development Water
Water Level (TIC) _____
Well Depth _____
Color _____
Odor _____
Clarity _____
Developed By _____
Date _____
Well Development Date _____
Description of Development Technique _____

Pump

Date Installed _____ Type _____
Manufacturer _____ Model No. _____
H.P. _____ Volts _____
Capacity _____
Depth of Pump Intake Setting _____
No. of Stages _____
 Oil Water Lubrication

Power Source _____
Material of drop pipe _____
Bowls _____
Shafting _____ Impellers _____
Bowl Diameter _____
Column Pipe Diameter _____ Length _____
Modification _____

Geophysical Logs Run Gamma, Resistivity, SP

Water Quality
Sample taken? Yes No
Where analyzed? _____

Date well completed 04/15/08

