2.K INJECTION PROCEDURES

Describe the proposed injection procedures including pump, surge tank, etc.

RESPONSE

The Dewey-Burdock wells are to be dedicated to the injection of fluids derived from the Dewey-Burdock ISL Project. Details regarding the waste stream, surface equipment and practices to be followed for operation of the well are presented in this attachment. Note that additional details regarding the wellhead, annulus components and surface facilities of the system are provided in Response 2.M of this document. Additional details regarding operating parameters for the system are included in Attachment H of this document.

Surface Facility Description

The Dewey-Burdock ISL facility is located in Custer and Fall River Counties, South Dakota, 13 miles north-northwest of Edgemont (Figure 1). Figure K-1 is a generalized process flow diagram of the major surface facility components. They consist of storage and pretreatment facilities, screens/filters and pumps with high pressure flow lines to the wellhead, and associated monitoring equipment.

Injection Procedures

Fluids will be collected at the Dewey-Burdock plant facilities and transported via existing flow line to the well sites. Depending on fluid quality and well performance, fluids may be routed through filters prior to injection into the wells. Fluids will then be transferred from a final head tank to the suction end of an injection pump. Injection will take place at desired flow rates with a maximum injection pressure not to exceed those specified in Table H-1 as previously indicated in this document (see Response 2.H). Higher pressures may be requested depending on site-specific test data obtained during well installation. Figure K-1 includes a general flow diagram of proposed instrumentation.

Well Operating Procedures, Alarms and Annulus Pressure Maintenance

It is anticipated that each well will be automated, but may also be operated manually. Operators will start the injection process by opening necessary valves to allow the pumps to be started, or for the wells to draw fluid from the storage tanks. Restraints will be incorporated into the well monitoring systems to meet UIC regulations and permit conditions. The automated control system will include control switches to alarm the operator if certain operating conditions are encountered. For regulatory purposes, a high injection pressure switch (set below the permit maximum) and a low annulus differential switch (set above the permit minimum) will shut-off injection pump power and will alarm the operator so that the well can be fully isolated and secured. In the event that any of the permit condition related set points are exceeded, injection operations will cease until the problem is identified, corrected, and the system is then manually restarted by an operator when compliance is verified.

Annulus pressure in the well system will be maintained with a nitrogen bottle attached to an annulus fluid reservoir (head tank). On days when injection takes place, annulus fluid level will be monitored in the annulus fluid head tank by the use of a level indicator or a sight glass, and additions or subtractions of fluid from the annulus tank will be recorded for monitoring purposes and reported on a quarterly basis per permit requirements.

If the proposed Dewey-Burdock Disposal Wells are monitored and operated remotely, the following

special conditions shall be applicable to each well. For the purpose of this permit, remote monitoring is defined as injection into the wells when a trained operator is not present on site property and able to perceive shut-down alarms and able to physically respond to the well controls or the wellhead within 15 minutes of a compliance alarm condition.

1. Local operating system and remote monitoring system: If remote monitoring is to be used to operate the well, an automatic pager designed to alert designated on-call, off-site personnel in the event of a well alarm or shut-in shall be onsite and equipped with a back-up power supply.

2. Response to automatic shut-downs: Alarm shut-downs of the operating well related to permit compliance conditions of the well shall be investigated on-site by a trained operator within three (3) hours of pager notification of the occurrence.

3. Loss of power to the control system: In the event of a power failure beyond the capability of the back-up power supply shuts down the control system, the well shall be shut-in.

4. Loss of dial tone: If the automatic pager cannot get a dial tone for 90 minutes, the well shall automatically be shut-in.

5. Restart of the well after an automatic shut-in: Restart of the well after a shut-in related to a permit condition alarm (including, but not limited to, injection pressure, annulus differential pressure, loss of dial tone for more than 90 minutes or control system power failure) shall require the physical presence of the operator on-site before the well can be restarted.

6. Restart of the well after non-permit condition related or scheduled shut-ins: If the well is shut-in for more than 48 hours for circumstances unrelated to permit conditions, restart of the well shall require the physical presence of the operator on-site.

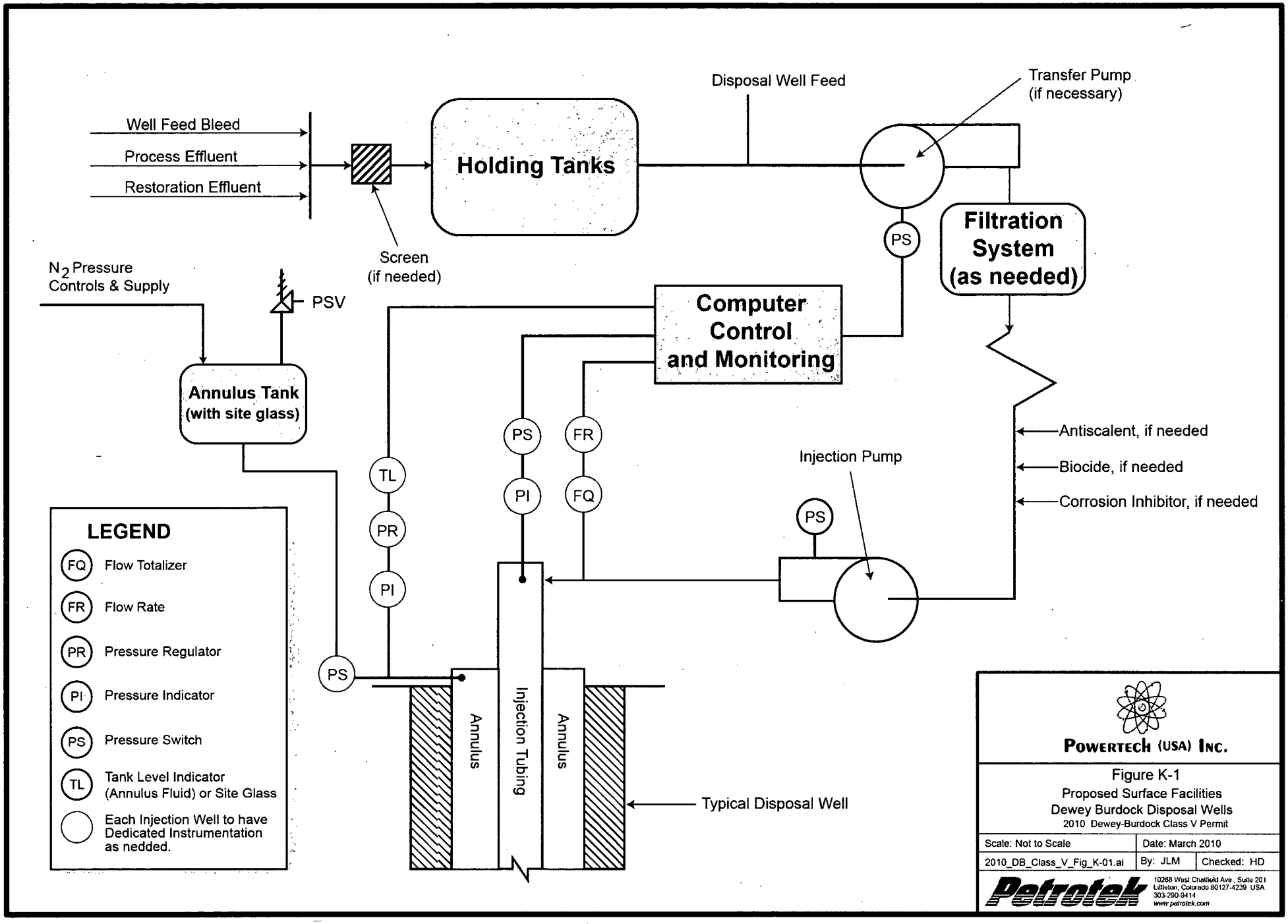
7. Monthly operator inspections: If fluid injection occurs during the period of any month and the well is being monitored remotely, a trained operator shall physically visit the site to inspect the facility at a minimum frequency of not less than once per month. This inspection shall verify the correct operation of the remote monitoring system by review of items such as, but not limited to, a comparison of the values shown on mechanical gauges with those reported by the remote operating system. Unless annulus pressure changes by more than 10 percent per week while the well is injecting, only one annulus fluid level per week shall be required to be taken, recorded and reported when injection takes place.

8. When the well is not actively being used for injection, one annulus tank fluid level measurement shall be taken, recorded and reported per month unless annulus fluid pressure decreases more than 10 percent per month. In such cases of increased annulus pressure change, annulus fluid level measurements shall be taken, recorded and reported twice per month.

9. When not in use by a trained well operator, offloading connections shall be secured and shall be locked at the valves leading to waste water tanks so that access is restricted to trained well operators.

10. In the event of well shut-down, it may become necessary to transport fluid by truck to an

alternate well site within the proposed Class V permit area. Offloading of fluid from transports can only occur with a trained operator physically present on site. A waste related log sheet and/or waste manifest file will be maintained documenting that a trained well operator allowed fluid to be unloaded. At a minimum, waste log entries are to include operator name, date, time, truck identification and approximate volume.


Well Feed Bleed
Process Effluent
Restoration Effluent
Screen
(if needed)
Holding Tanks
Disposal Well Feed
Transfer Pump
(if necessary)
PS
Filtration
System
(as needed)
N2 Pressure
Controls & Supply
PSV
Computer
Control
and Monitoring
Annulus Tank
(with site glass)
PS
FR
TL
PI
FQ
PR
PI
Injection Pump
PS
Antiscalent, if needed
Biocide, if needed
Corrosion Inhibitor, if needed
PS
Annulus
Injection Tubing
Annulus
Typical Disposal Well
LEGEND
FQ Flow Totalizer
FR Flow Rate
PR Pressure Regulator
PI Pressure Indicator
PS Pressure Switch
TL Tank Level Indicator
(Annulus Fluid) or Site Glass
Each Injection Well to have
Dedicated Instrumentation
as nedded.
POWERTECH (USA) INC.
Figure K-1
Proposed Surface Facilities
Dewey Burdock Disposal Wells
2010 Dewey-Burdock Class V Permit
Scale: Not to Scale
Date: March 2010
2010_DB_Class_V_Fig_K-01.ai
By: JLM
Checked: HD
Petrotek
10288 West Chatfield Ave., Suite 201
Littleton, Colorado 80127-4239 USA
303-290-9414
www.petrotek.com

2.L CONSTRUCTION PROCEDURES

Discuss the construction procedures (according to §146.12 for Class I, §146.22 for Class II, and §146.32 for Class III) to be utilized. This should include details of the casing and cementing program, logging procedures, deviation checks, and the drilling, testing and coring programs, and proposed annulus fluid (Request and submission of justifying data must be made to use an alternative to a packer for Class I).

RESPONSE

The proposed Dewey-Burdock Disposal Wells are to be newly installed Class V wells. DW Nos. 1 and 2 will be constructed at Site 1 DW No. 1 located in the NE ¼ of the NW ¼ of the SW ¼ of Section 2, T 7 S, R 1 E, Fall River County, South Dakota DW Nos. 3 and 4 will be constructed at Site 2 located in the SE ¼ of the NW ¼ of the SW ¼ of Section 29, T 6 S. R 1 E, Custer County, South Dakota (Figures B-2 and B-2a). In the event that additional wells are required to inject at the requested 300 gpm site rate, locations within the proposed Class V permit area will be determined at a later date.

At Site 1, ground level is estimated to be approximately 3,710' above mean sea level (AMSL); Kelly Bushing (KB) will be dependent on rig size and availability. DW No. 1 will be drilled to a Total Depth (TD) of approximately 3,195' BGS to the top of the Precambrian basement. Following testing procedures in the Minnelusa, Madison, and Deadwood formations, the well will be completed in the Minnelusa Formation. DW No. 2 will be drilled to a TD of approximately 3,195', or to the top of the Precambrian basement, and completed in the Deadwood and granite wash.

At Site 2, ground level is estimated to be approximately 3,650' above mean sea level (AMSL); Kelly Bushing (KB) will be dependent on rig size and availability. DW No.3 will be drilled to a TD of approximately 2,740' BGS through the top 790' of the Minnelusa and completed in that formation. DW No. 4 will be drilled to a TD of approximately 3,530' BGS, or to the top of the Precambrian basement, and completed in the Deadwood and granite wash.

The drilling program for each well will include the addition of a tracer in the drilling mud to enable evaluation of all formation fluid sample quality as well as instructions for conducting deviation checks or surveys at regular intervals throughout the drilling process. Casing and cementing depths are summarized in Table L-1 and Figures M-1 through M-4 and the logging program is presented in Table L-2. Each well will incorporate centralizers on casing and cement with a minimum of 20% excess where applicable as described in the DW No. 1 section below. The nature of the proposed annulus fluid is described at the end of this section.

Drilling, Casing and Testing Program

The primary objective for DW No. 1 is to drill to basement and conduct formation testing of target injection zones, verify assumed parameters, and confirm the presence and suitability of confining zones. The DW No. 1 will then be plugged back to the top of the Madison and completed as a Minnelusa injection well.

DW No. 1

The 13 3/8" conductor casing will be set at approximately 60'. A 12 ¼" surface hole will then be drilled to the top of the Minnelusa at an anticipated depth of 1,615'. The surface casing, 9 5/8-inch, 61 lb/ft, J-55 grade, ST&C, or suitable equivalent will be cemented to surface using Class A cement with additives from the top of the Minnelusa Formation.

An 8 ½" hole will be drilled out of the surface casing through the Minnelusa Formation to near the top of the Madison at a depth of approximately 2,765' (Figure M-1). Openhole testing and logging (Table L-2) will be conducted in the Minnelusa to determine optimum zones for injection in the upper portion of the formation. Fluid sampling using wireline equipment or other methods as dictated by equipment availability and hole conditions will also be conducted to assess formation fluid quality. A tracer will be added to the drilling mud to enable evaluation of the fluid sample quality. In addition, the lower portion of the Minnelusa will be tested to determine the suitability to serve as a confining zone. Once testing procedures have been completed, 7" 20 -26 lb/ft, J-55, ST&C, or suitable equivalent intermediate casing will be run to the base of the Minnelusa at approximately 2,765' and will be cemented to surface based on 20% excess using Class A cement with additives. Additional excess cement, if any, will be pumped based on field conditions. It is anticipated that a float shoe will be used with a float collar one or two joints up from the bottom and that centralizers will be placed a minimum of one every fifth joint.

After the production casing string has been cemented, a cement bond log will be conducted to document cement circulation placement. The cement will be drilled out of the intermediate string and a 6 ¼" hole will be drilled through the Madison, Englewood, Deadwood, and granite wash to TD at approximately 3,195' at the top of the Precambrian basement. Further formation testing, logging, and fluid sampling will be conducted in the Madison and Deadwood Formations to assess formation properties and fluid characteristics and confirm suitability for use of the Deadwood as an injection zone for subsequent wells. Once formation testing is completed, the well will be plugged back to the base of the Minnelusa at approximately 2,765'. Table L-1 presents a summary of drilling, casing, and cementing depths.

During completion operations, the upper portion of the Minnelusa will be perforated. The perforation intervals will likely occur from 1,615' – 2,205', but will ultimately be determined after logging and formation testing. A packer will be set at a depth of approximately 1,535' inside the 7" production string casing. Injection tubing with a diameter of 2 7/8" is proposed for the completion. As appropriate, coated tubing and a coated packer may be used to manage potential corrosion issues. A radioactive tracer survey and a temperature log will then be conducted to establish baseline conditions and initial external mechanical integrity. A pressure transient build up/falloff test will also be conducted to derive estimates of formation pressure and properties (See Response 2.I). The proposed well schematic for DW No. 1 is presented in Figure M-1.

DW No. 2

The primary objective for DW No. 2 is to be drilled to basement and is to be completed as an injection well in the Deadwood Formation.

After 13 3/8" conductor casing is set at approximately 60', 12 ¼" surface hole will be drilled through the Minnelusa to the top of the Madison at approximately 2,765'. Following openhole logs, 9 5/8" surface casing will be set and cemented from approximately 2,765' to surface. An 8 ½" bit will be used to drill to an estimated TD of 3,200' at the top of the Precambrian basement. Following logging, formation testing, and fluid sampling, 5 ½" casing will be run and cemented from TD to approximately 2,465', or 300' above the top of the Madison. The well would be completed in the Deadwood and granite wash. Proposed drilling, casing, and cementing depths are summarized in Table L-1. A proposed well schematic including completion details for DW No. 2 is presented in Figure M-2.

DW No. 3

The primary objective for DW No. 3 is to be drilled through part of the Minnelusa and is to be

completed as an injection well in the porous zones in the upper portion of that formation.

Conductor casing (9 5/8") will be set at approximately 60'. An 8 ½" bit will then be used to drill to an estimated TD of 2,740', or approximately 200' below the base of the effective porosity of the Minnelusa Formation. . Following logging, formation testing, and fluid sampling, 5 ½" casing will be run and cemented from TD to surface. Proposed drilling, casing, and cementing depths are summarized in Table L-1. A proposed well schematic including completion details for DW No. 3 is presented in Figure M-3.

DW No. 4

The primary objective for DW No. 4 is to be drilled to basement and is to be completed as an injection well in the Deadwood Formation.

After 13 3/8" conductor casing is set at approximately 60', 12 ¼" surface hole will be drilled through the Minnelusa to the top of the Madison at approximately 3,100'. Following openhole logs, 9 5/8" surface casing will be set and cemented from approximately 3,100 to surface. An 8 ½" bit will be used to drill to an estimated TD of 3,530' at the top of the Precambrian basement. Following logging, formation testing, and fluid sampling, 5 ½" casing will be run and cemented from TD to approximately 2,800', or approximately300' above the top of the Madison. The well would be completed in the Deadwood and granite wash. Proposed drilling, casing, and cementing depths are summarized in Table L-1. A proposed well schematic including completion details for DW No. 4 is presented in Figure M-4.

Additional wells will be constructed, logged, and tested as described above.

Nature of Annulus Fluid

In the proposed Dewey-Burdock wells, the annulus space between the injection tubing and the well protection casing will be sealed and filled with fresh water containing a corrosion inhibitor, an oxygen scavenger and a biocide, as needed. Annulus fluids will include Baker Petrolite CRW0037F or Unichem Technihib 366W corrosion inhibitors and bactericides, CRW 132 oxygen scavenger, A-303 corrosion inhibitor, Knockout 50 oxygen scavenger, and Bacban 3 Biocides or suitable equivalents. No permit conditions regarding specific brands or fluid additives are requested or required.

TABLE L-1 Subsurface Well Construction Details

	Site 1		Site 2	
	DW No. 1	DW No. 2	DW No. 3	DW No. 4
Conductor (in)	13 3/8	13 3/8	9 5/8	13 3/8
Depth (ft)	60	60	60	60
Surface Hole (in)	12 1/4	12 1/4	n/a	12 1/4
Depth (ft)	1615	2765	n/a	3100
Surface Casing (in)	9 5/8	9 5/8	n/a	9 5/8
Cement Interval (ft)	0-1615	0-2765	n/a	0-3100
Production Hole (in)	8 1/2	8 1/2	8 1/2	8 1/2
Depth (ft)	2765	3195	2740	3530
Production Casing (in)	7	5 1/2	5 1/2	5 1/2
Cement Interval (ft)	0-2765	2465-3195	0-2740	2800-3530
Open Hole (ft)	6 1/4	n/a	n/a	n/a
Total Depth (ft)	3195	3195	2740	3530
PBTD (ft)	2765	n/a	n/a	n/a
Injection Interval	Minnelusa	Deadwood	Minnelusa	Deadwood

TABLE L-2 List of Proposed Logs for Dewey-Burdock Disposal Wells

Description	Depth Run at DW No. 1 (ft, BGS)	Depth Run at DW No. 2 (ft, BGS)	Depth Run at DW No. 3 (ft, BGS)	Depth Run at DW No. 4 (ft, BGS)
Dual Induction Laterolog Gamma Ray, BHC Sonic, Formation Density, and Caliper Logs (openhole before production casing)	0-1,615	0-2,765	0-2,740	0-3,100
Cement Bond Log (Surface casing)	0-1,615	0-2,765	0-2,740	0-3,100
Dual Indution LateroLog, SP, Gamma Ray, BHC Sonic, Formation Density, Compensated Neutron, and Caliper Log (openhole before production casing)	1615-3195	2765-3195	0-2740	3100-3530
If required, Fracture Finder ID Log (openhole before production casing)	1615-3195	2765-3195	0-2740	3100-3530
Cement Bond Log and Casing Inspection Log (productioncasing)	0-2765	0-3195	0-2740	0-3530
Temperature Log	0-2765	surf-TD	surf-TD	surf-TD
Radioactive Tracer Log*	Production casing	Production casing	Production casing	Production casing
Pressure/Temperature Gradient and Pressure Transient Falloff test	Injection Intervals	Injection Intervals	Injection Intervals	Injection Intervals

Note: all depths are estimated based on area type logs

* RAT run in and approximately 500' above injection zone