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Petrotek

CENTENNIAL PROJECT

SECTION 33 PUMPING TEST PLAN

WELD COUNTY, COLORADO

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Division of Reclamation, Mining and Safety

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NON CONFIDENTIAL

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1.0 INTRODUCTION

The Centennial Project is a proposed in-situ uranium mining project located in Weld County, Colorado. The Project area is located approximately 15 miles northeast of the City of Fort Collins and is shown on Figure 1. The proposed project entails the extraction of uranium via in-situ recovery (ISR) methods from the ore bearing sands of the Fox Hills Sandstone Formation.

This Pumping Test Plan provides a summary of the objectives, procedures, and equipment for the conduct of a regional pumping test in Section 33, T10N, R67W. The intent in the development of this plan is to satisfy Colorado's recent statute (HB 08-1161), rules and regulations of the Colorado Department of Public Health and Environment (CDPHE), Colorado Department of Reclamation Mining and Safety (DRMS), and the U.S. Nuclear Regulatory Commission's (NRC) NUREG 1569 (Section 2.7 Hydrology). The data gathered will assess the viability of applying conventional in-situ mining methods and will also provide information relative to feasibility of monitoring systems for the project.

The principal host for the uranium mineralization in the Centennial Project area is the "A_2 Sand" horizon within the Fox Hills Sandstone. The pumping test will entail pumping from a central production well to be completed in the A_2 Sand and monitoring the groundwater response during pumping and recovery in the pumping well and in a network of monitoring wells to be completed in the A_2 Sand, and in the overlying Laramie Formation, and underlying WE and B Sands within the Fox Hills Sandstone.

The objectives of the proposed pumping test are detailed in Section 2.0. The general site characterization and local stratigraphy are described in Section 3.0. The monitoring well configuration and well installation procedures are discussed in Section 4.0. Section 5.0 describes the protocols for conducting the test, and Section 6.0 describes the procedures for the analysis and interpretation of the test results. Section 7.0 describes the management and disposal of produced water. Section 8.0 describes site security and monitoring that will take place throughout the test.

The proposed pumping test is scheduled for October 2009. The drilling and installation of the production well and monitoring wells is expected to be complete in August 2009.

2.0 PURPOSE OF TEST

The objectives of the Section 33 pumping test described in this plan are to:

1. Collect site-specific information on geology and groundwater conditions in Section 33 and for the regional hydrogeological characterization;

2. Assess the hydrologic characteristics and their lateral continuity within the mineralized production zone (i.e., A_2 sand horizon);

3. Assess hydrologic communication in the mineralized zone between the pumping well and surrounding production zone monitoring wells;

4. Assess the presence of hydrologic boundaries, if any, within the production zone; and

5. Evaluate the degree of hydrologic communication, if any, between the production zone and the overlying and underlying aquifers in the test area.

3.0 GENERAL SITE CHARACTERIZATION

The Centennial Project area was extensively investigated by Rocky Mountain Energy (RME) during the late 1970s and early 1980s. Subsequently, Powertech (USA) has resumed exploratory drilling within the vicinity and project development.

The project is located within the Cheyenne Basin, a sub-basin of the greater Denver-Julesburg, or DJ, Basin, which is bordered on the northwest by the Hartville Uplift in Wyoming and on the east and northeast by the Chadron Arch in Nebraska (Figure 2). To the south, the Cheyenne Basin is separated from the Denver Basin by the Greeley Arch. To the west, the basin borders the Colorado Front Range (Voss & Gorski, 2007).

During Laramide orogeny and uplift of the ancestral Rocky Mountains to the west and subsidence of the Cheyenne and Denver Basins to the east, a thick sequence of sediments, ranging in age from Pennsylvanian to Quaternary, accumulated. The Late Cretaceous Pierre Shale represents offshore marine depositions and has a gradational contact with the overlying Fox Hills Sandstone, which represents near shore deposition and, as noted, is the host rock for the uranium mineralization. Overlying the Fox Hills Sandstone is the Laramie Formation, which consists of terrestrial fluvial deposits (Voss & Gorski, 2007).

Unconformably overlying the Laramie Formation is the tuffaceous White River Formation, which contains volcanic fragments and is thought to be a source of the uranium. In the project area, the White River Formation has been deeply eroded with only isolated remnants remaining (Voss & Gorski, 2007).

The generalized stratigraphic section (Figure 3) in the vicinity of the Section 33 pumping test is described below.

Laramie Formation – This is a late Cretaceous terrestrial, fluvial sequence, comprised of thin, scattered lenticular sandstone lenses, interbedded with siliceous and carbonaceous mudstones and siltstones. In the northern Centennial area, the Laramie is 500 to 600 feet thick. In the southern portion of the project, the Laramie is entirely eroded away. The boundary between the Laramie Formation and the underlying Fox Hills Sandstone is a lagoonal lignite bed.

Fox Hills Sandstone – The Fox Hills was deposited as part of the final retreat of the Cretaceous Seaway from North America. The Upper Fox Hills Sandstone represents shoreline deposits, comprised of lagoonal muds, barrier island sands and tidal and distributary channel sands. The Lower Fox Hills represents deeper marine deposition such as delta front, offshore bar and distributary sands, along with offshore muds and silts.

The Fox Hills Sandstone is generally subdivided into the Upper and Lower Fox Hills Members.

Upper Fox Hills

A_1 Sand – The A_1 Sand immediately underlies the lignite sequence at the base of the overlying Laramie Formation. The A_1 is primarily a channel sand, 0 to 35 feet thick. When absent, this stratigraphic interval contains mudstones, siltstones and carbonaceous clays. When present, there is usually a 5-8 foot confining layer of clays at the base of this unit, between the A_1 Sand and A_2 Sand. In the central portion of the Project area, the A_1 Sand scours down into the A_2 Sand, removing any confining clays and resulting in a single A_1/A_2 Sand with a total thickness of up to 60 feet. In this central portion of the project area (Sections 9 & 10, T9N, R67W), the A_1 Sand has uranium resources of interest.

A_2 Sand – The A_2 Sand immediately underlies the A_1 Sand and is the most significant host sandstone within the project area, containing approximately 70% of all identified resources. Past exploration drilling encountered a continuously mineralized oxidation/reduction boundary of over 20 miles within this sand unit in the Centennial area. It is approximately 30 feet thick in the northern portion of the project area and as much as 60 feet thick in the southern portion. In the central and north-central portion of the project area, these barrier island sands have been cut into, and in some cases, replaced by thick distributary channel sand sequences.

A_2 Confining Unit – Underlying the A_2 Sand is the A_2 Confining Unit. This unit averages 6 to 8 feet thick and is consistently present throughout most of the Centennial Project. Analyses on core from the 2007 drilling program showed vertical permeabilities ranging from 8 x 10^{-8} to 5 x 10^{-9} centimeters per second (Powertech USA, Inc., nd). In the central portion of the project area, there is a small area where this unit has been removed by an A_1 Sand channel, resulting in a combined A_1/A_2 Sand averaging 60 feet thick.

A_3/A_4 Sand – The A_3/A_4 Sand is a highly variable unit, containing from 0 to 35 feet of sand. Throughout most of the project area, this unit consists of thin A_3 and/or A_4 beach and channel sands, interbedded with mudstones and siltstones. In places, active channeling within these sands resulted in the formation of a massive A_3/A_4 Sand, which scoured down into the underlying WE Sand. This sand unit is unmineralized within the Centennial Project area, with the exception of Section 32 & 33, T10N, R67W, where a small resource area has been developed within a 35-foot thick channel sandstone.

A_4/WE Confining Unit – As noted above, the A_3/A_4 Sand locally is scoured through the A_4/WE Confining Unit into the underlying WE Sand. As such, the confining unit is discontinuous.

WE Sand – Underlying the A_3/A_4 Sand is the WE Sand, which is a major host for uranium mineralization in the southern portion of the project area. Historic drilling encountered 12 to 15 miles of continuously mineralized oxidation/reduction boundary within this sand. Similar to the A_2 Sand, the WE Sand is a typical barrier island sandstone, averaging 30 to 50 feet thick. In the central portion of the project, combined A_3/A_4 Sand and WE Sand thickness exceeds 60 feet as a result of channeling.

AB Confining Unit – This confining unit separates the Upper Fox Hills from the Lower Fox Hills and underlies the entire project area. It averages 20 feet in thickness and consists of clays, carbonaceous muds and some washover sands.

Lower Fox Hills

B Sand – The B Sand is a delta front, foreshore sand that underlies the entire project area. It has a characteristic coarsening-upward electric log response and has a total thickness of approximately 125 feet. Most of the domestic wells in the project area are producing from this sand unit. There is a weakly mineralized oxidation/reduction boundary in the upper portion of this sand.

C Sand – The C Sand is an offshore bar sand that is present only in the northeast portion of the project area. It is a 100-foot thick sandstone unit that is shown to be weakly mineralized in historic drilling.

4.0 MONITORING WELL CONFIGURATION and INSTALLATION

In the Section 33 area, the primary target zone with respect to uranium mineralization is in the A_2 Sand. There are also zones within both the underlying A_3/A_4 Sand and the WE Sand units that contain uranium. Because of scouring through the intervening confining units during deposition of the overlying units, adjacent sand unit may be contiguous and the intervening confining unit discontinuous. Given the occurrence of mineralized zones with multiple sand units and the discontinuous nature of the intervening confining units, consideration is being given to applying for an aquifer exemption for the entire sequence above the AB Confining unit including both the A and WE Sands.

For the purpose of the proposed pumping test, the focus is on the hydrogeological characterization of the A_2 Sand and the degree on hydraulic communication, if any, between the production zone and the overlying and underlying aquifer, namely the Laramie Formation and the B Sand.

The proposed layout of the Section 33 Pump Test is shown on Figure 4. As shown, the layout includes a central pumping well (PW1) to be completed in the A_2 Sand. Three monitoring wells will be completed in the overlying Laramie Formation (MO1, MO2,and MO3), five monitoring wells will be completed in the production zone (MM1, MM2, MM3, MM4, and MM5), one monitoring well will be completed in the underlying WE Sand (MU1), and three monitoring wells will be completed in the underlying B Sands (MUU1, MUU2, and MUU3). As shown, monitoring wells will be located spatially in order to define the regional potentiometric gradients in the Laramie Formation, A_2 Sand, and in the underlying B Sand. The proposed completion zone, coordinates, and projected depth for the pumping well and each of the monitoring wells are listed in Table 1.

Drilling & Well Completion

At the pumping well and each monitoring well location, a pilot hole will be drilled to the projected total depth and logged geophysically including gamma, single point resistivity, spontaneous potential, and deviation. Based on the geophysical logs, the completion interval and screen length will be determined on a well-specific basis. Based on existing logs for the pumping test area, it is anticipated that the screen length in most wells will be about 20 feet.

The position and length of the completion interval (i.e., sand pack) will also be determined on well-specific basis. It is anticipated that the pumping and monitoring wells will be fully penetrating and completed across the full sand intervals selected in the Laramie, A_2, and WE, though the B Sand may be partially penetrated due to its large thickness.

The construction detail for a typical production or monitoring well installation is shown on Figure 5.

Survey

Following completion, the pumping well and each of the monitoring wells will be surveyed with respect to ground surface and top of casing elevation (i.e., measurement point) and X-Y coordinates.

Previous Section 33 Pumping Tests

Powertech previously completed pumping tests in October 2007 and in February 2008 at a location approximately 400 feet south of the planned Section 33 pumping test. The locations of the pumping well and the monitoring wells installed for and used in these tests are shown on Figure 4. The pumping well (IS-003T) and two monitoring wells (IS-003Tc and IS-003Td) are completed in the A_2 Sand. Monitoring well IS-003Ta is completed in the overlying Laramie Formation and monitoring well IS-003Tb is completed in the underlying WE Sand.

During the planned Section 33 pumping test, the pumping well and the monitoring wells completed in the Laramie and underlying WE Sand and used in the previous tests will be instrumented with level Trolls® and monitored for changes in water levels. The two remaining wells completed in the A_2 Sand will be hand tagged.

Summary

It is important to note that in the layout of the test, the monitoring wells configuration provides both east-west and north-south coverage in order to determine potentiometric elevations for the different units, and the regional hydraulic gradients in the Laramie Formation, A_2 Sand, and B Sand. This is a critical component of the pumping test design, given that the confining zones between the A_2 and WE Sands, and between the WE Sand and underlying B Sand are locally one foot or less.

Also shown on Figure 4 is the location of a proposed core hole (IN-14-33), which is to be cored for the full depth through Laramie into the B Sand. This core hole will be plugged and abandoned.

The construction detail for a typical production well or monitoring well installation is shown on Figure 5.

5.0 TESTING EQUIPMENT and DESIGN

The pump test will be performed using an electrical submersible pump set at an approximate depth of 550 feet.

Prior to starting the primary test, a step-rate test will be conducted. Based on the results from this test, the optimum pumping rate and duration of the test will be determined.

During both the step-rate and constant-rates tests, water levels in all observation wells will be measured and recorded with integrated level TROLL® transducer/datalogger units manufactured by In-Situ, Inc. The automated equipment will be programmed prior to the test with an initial reference level (depth to water). Water levels will be recorded according to a pre-determined time schedule.

The pressure rating for the transducers/TROLLs® will range from 10 to 100 psi, as warranted, for each monitoring location. Vented cables will be used to minimize the impact of barometric fluctuations. Barometric pressure also will be recorded throughout the testing period.

6.0 TESTING and ANALYTICAL PROCEDURES

Prior to the pumping period, the testing equipment will be installed and checked for proper operation. To assess potential background trends in groundwater levels, baseline level information will be collected during a 72- to 96-hour period prior to the conduct of the pumping test.

The pumping well will be started and maintained at a constant rate for an estimated period of 3 to 6 days. As noted, the pumping rate will be determined based on the results of the step-rate test.

Barring unexpected variations in hydrogeologic properties, a minimum drawdown 0.2 feet with a 'cause and effect' relationship will be considered "significant" with respect to demonstration of hydraulic connection between the pumping well and the production zone monitoring wells. At the end of the pumping period, monitoring will continue until 80 to 90 percent recovery is achieved.

Conventional analytical techniques (i.e., log-log, semi-log, and distance-drawdown methods developed by Theis, Jacob, and Cooper and Jacob, respectively) will be used to evaluate the response of the aquifer to pumping and to assess the hydraulic characteristics of the A_2 production zone. Theis recovery analyses will be performed on the pumping well, and if necessary, on some of the monitoring wells. Other analytical methods (e.g., Hantush, Neuman, etc.) will be employed for the monitoring wells if warranted. The analyses will be performed using the Aquifer Test software package (Waterloo Hydrogeologic, Inc.).

Following the conclusion of the field activities and data analysis, a report that fully discusses the pump test objectives, procedures, and results will be prepared. The report will include discussion of monitoring well installation procedures and geologic data; background water-level trends; hydrogeologic characteristics of the ore zone (A_2 Horizon); water-level responses in the A_2 Production Zone; and responses in the overlying and underlying aquifers, if any.

7.0 PRODUCED WATER MANAGEMENT and DISPOSAL

Produced Water Containment

Groundwater produced during the step-rate and primary aquifer pumping test will be totally contained onsite within several "Baker" mobile storage tanks, each with a 500 barrel holding capacity. Initially four Baker tanks will be staged onsite in a topographically flat area located just down gradient from the pump well providing 84,000 gallons of holding capacity. This number is sufficient to contain the estimated fluid that will be produced from both the step-rate and primary pump test. After performing the step rate test, if it is determined that additional tanks may be needed to hold all the fluid produced from the primary pump test, they will be brought onsite and ready for use before start of the pumping test. The Baker style tanks will be decontaminated before and after their use.

Produced water will be piped above ground from the pumping well to a manifold that will allow filling of the tanks without interruption of the well flow. Valving on the manifold will allow switching of the tanks as needed and the filling of more than one tank simultaneously. Pressure, flow rate, and tank levels will be monitored during the test.

All tanks and piping will be fully fenced to keep livestock and wildlife away from the temporary infrastructure associated with the pumping test.

Produced Water Disposal

At the conclusion of the aquifer test, all waters produced from the step-rate and primary pumping tests will be re-injected back into the same formation from which it was extracted. Powertech is currently seeking authorization for water injection through the Environmental Protection Agency's (EPA) Underground Injection Control (UIC) program, utilizing a Class V permit. A requirement of the Class V permit is that Powertech demonstrates that there is no potential for hydrogeologic communication with overlying Underground Sources of Drinking Water (USDW), in this case the Laramie Formation, through the injection well and its annular space. Powertech will demonstrate injection well integrity by performing a pressurized mechanical integrity test (MIT).

Water will be routed from the Baker Tanks to a transfer pump and then to the injection well head. Based upon current information, it is not expected that the well head will be operated under pressure. However, the well head will be sealed to allow use of the transfer pump to pressure the system if necessary. Pressure and flow rate will be monitored at the well head. There will be a flow control valve or adjustable speed drive on the transfer pump to regulate flow and pressure to the injection well head. The maximum operating injection pressure will be kept below a limit based upon the results of the mechanical integrity test performed on the injection well casing and/or requirements of the EPA permit, whichever is lower. Should the operating pressure approach this limit, injection flow will be decreased or shut down so that the limit is not exceeded. Due to the expected short duration of the test, all piping will be placed upon the ground surface and will be secured and fenced.

8.0 SITE SECURITY and MONITORING

Site Security

Throughout the entire duration of the step-rate and primary aquifer pumping tests Powertech personnel will be onsite to provide site security 24 hours each day. Powertech will provide a camper so the onsite personnel can be comfortable and not be exposed to the weather elements. In addition, the entrance to the lands in which the aquifer test will take place will be locked and secured.

During re-injection of the produced aquifer test water Powertech personnel will conduct site security inspections every 4 hours between the hours of 8:00 AM and 8:00 PM, 7 days each week. In addition, coordination will be made with the Nunn Police Department to be available to conduct security inspections during the late hours of the night. The entrance to the lands in which the re-injection will take place will always be locked and secured.

Monitoring of Operations

During operation of the step-rate and primary aquifer pumping tests monitoring will take place 24 hours each day and detailed checks to insure proper operation of infrastructure will take place at specific time intervals. During the step-rate test detailed checks of proper operation will be constant. During the first 8 hours following start-up of the primary pump test, detailed checks will take place every hour. Following the first 8 hours of operation detailed checks will be conducted every 4 hours until the primary pump test is complete. Below is a list of checks to be performed during operation of the step-rate and primary aquifer pumping tests.

- Check fencing to insure integrity.
- Check Baker Tank water levels.
- Check pump flow rate.
- Check piping, fittings, and Baker Tanks for water leaks.
- Check fuel level in the electrical generator.
- Check real-time water level in the pump well.

At about midway through the primary aquifer test, water level checks will begin to take place at distant monitoring wells completed within the production zone. The purpose of this exercise is to insure a proper aquifer response is taking place that will allow an adequate analysis of the collected pump test data. In addition, an adequate response in the distant monitoring wells will also dictate the length of the pump test.

Monitoring and detailed checks will also take place during the re-injection of the produced pump test water. During the first 8 hours of re-injection constant monitoring and detailed checks will take place to insure proper operation. After that, detailed checks will take place every 4 hours between the hours of 8:00 AM and 8:00 PM every day that re-injection is taking place. Below is a list of checks to be performed during the re-injection process.

- Check Baker Tank water levels.
- Check injection flow rate and pressure.
- Check piping, fittings, and Baker Tanks for water leaks.
- Check fuel level in electrical generator.
- Check site fencing, gates, etc.

If at any point during the aquifer test or re-injection of the pump test water any leaks are detected that cannot be immediately controlled, the operation of the pump test or re-injection will cease immediately.

Radiological Monitoring

Experience with numerous pump tests has indicated there is no significant potential for exposure to radiation that might be related to the wells and related activity. However, in order to demonstrate that any potential radiation dose from the planned pump test is negligible, Powertech will perform radiological monitoring at the pump test sites.

Prior to beginning the aquifer pump test, radon monitoring stations will be deployed to collect background radon emission levels at and around the location of the pump test and the Baker Tanks. Background radon detectors will be collected and analyzed prior to beginning the pump test and re-injection. The radon monitoring stations will have new radon detectors installed in order to collect information on radon emission levels during the pump test and re-injection process. Also during the scheduled monitoring intervals listed above, gross gamma emission monitoring will take place. Gamma emission levels will be taken using a passive integrated hand-held device that has been properly calibrated.

Throughout the duration of all operations, personal radiation exposure levels will be monitored for all personnel onsite. All personnel will be required to wear a personal thermo-luminescent dosimeter badge anytime they enter an area where operations are taking place.

9.0 REFERENCES CITED

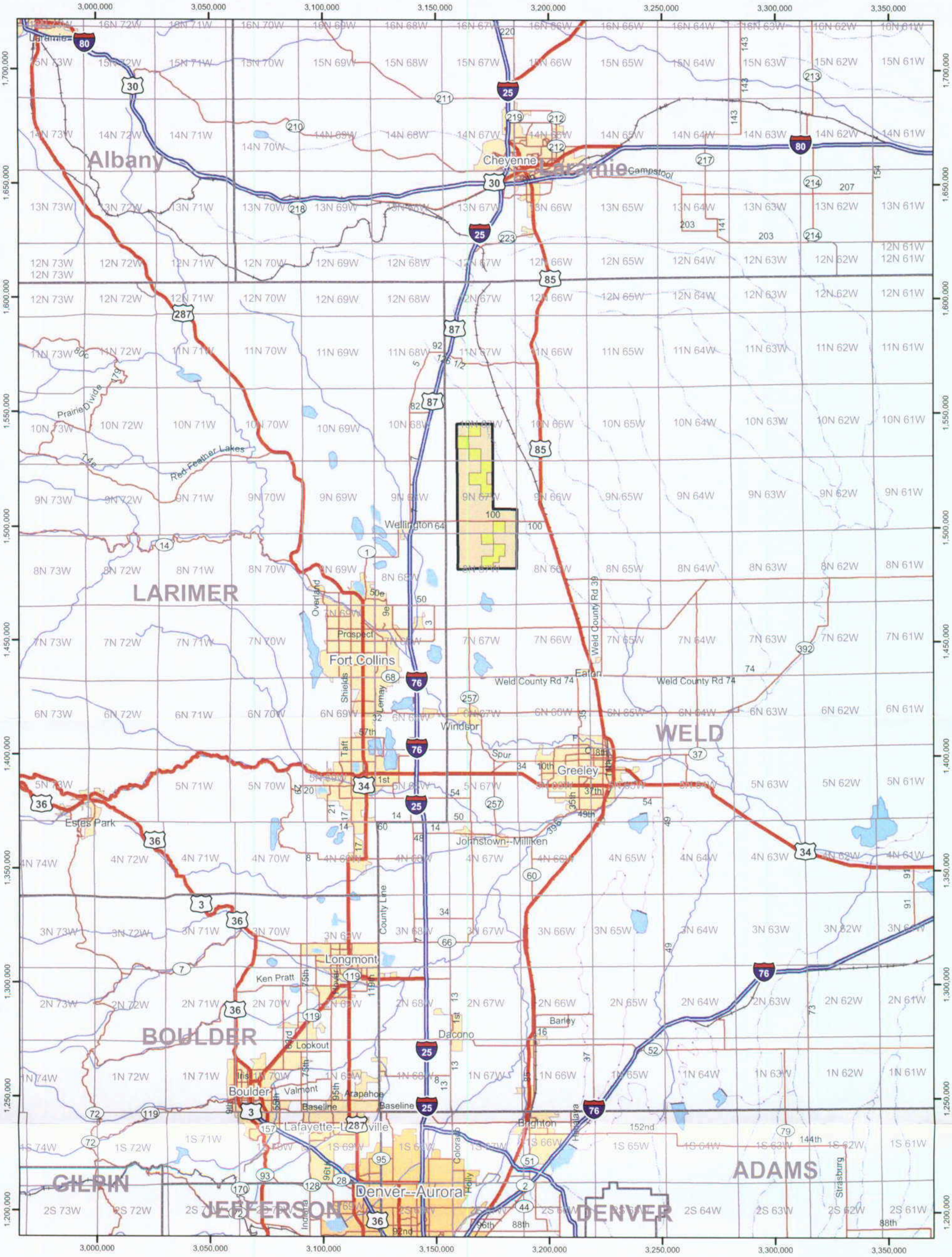
Powertech (USA), Inc., nd. *Centennial Stratigraphy*. Generalized Stratigraphic Description and Cross Section A-A', Section 33, T10N, R67W.

Voss, W. Cary, and Daniel E. Gorski, 2007. *Report on the Centennial Project, Weld County, Colorado.* Report prepared for Powertech Uranium Corp., Vancouver, BC, 41pp.

Table 1 - Section 33 Pumping and Monitoring Well Summary

STR	Well or Core Hole	Hole Type	Easting	Northing	Approximate Depth in feet (Subject to Change)	Approximate Diameter in inches (Subject to Change)
Section 33, T10N, R67W	IN08-33-MM1	A2 Observation Well	2,168,510.22	531,821.17	520	10.5
	IN08-33-MM2	A2 Observation Well	2,166,679.75	532,510.88	550	10.5
	IN08-33-MM3	A2 Observation Well	2,169,712.25	533,373.69	575	10.5
	IN08-33-MM4	A2 Observation Well	2,168,026.30	533,810.37	610	10.5
	IN08-33-MM5	A2 Observation Well	2,168,932.49	530,326.29	500	10.5
	IN08-33-MO1	Laramie Observation Well	2,168,417.16	532,023.58	400	10.5
	IN08-33-MO2	Laramie Observation Well	2,166,703.85	532,504.22	340	10.5
	IN08-33-MO3	Laramie Observation Well	2,169,702.39	533,350.74	360	10.5
	IN08-33-MU1	WE Observation Well	2,168,417.16	532,002.64	600	10.5
	IN08-33-MUU1	B-Sand Observation Well	2,168,417.16	531,974.73	660	10.5
	IN08-33-MUU2	B-Sand Observation Well	2,166,728.10	532,497.56	695	10.5
	IN08-33-MUU3	B-Sand Observation Well	2,169,693.47	533,327.40	675	10.5
	IN08-33-PW1	A2 Pumping Well	2,168,417.16	532,049.18	560	10.5

Datum: NAD 27 CO NT



Legend

Mineral_Rights_Lease_NorthArea

Mineral_Rights_Lease_SouthArea

Centennial_Property_Boundary

N

Miles

0 2.5 5 10 15

Projection: Colorado State Plane North, NAD 83 (feet)

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Figure 1
Location Map
Powertech Centennial Facility

Project: 321-5	Date: January 2009	
PC1FS_Figure_1.mxd	By: JLM	Checked: HD

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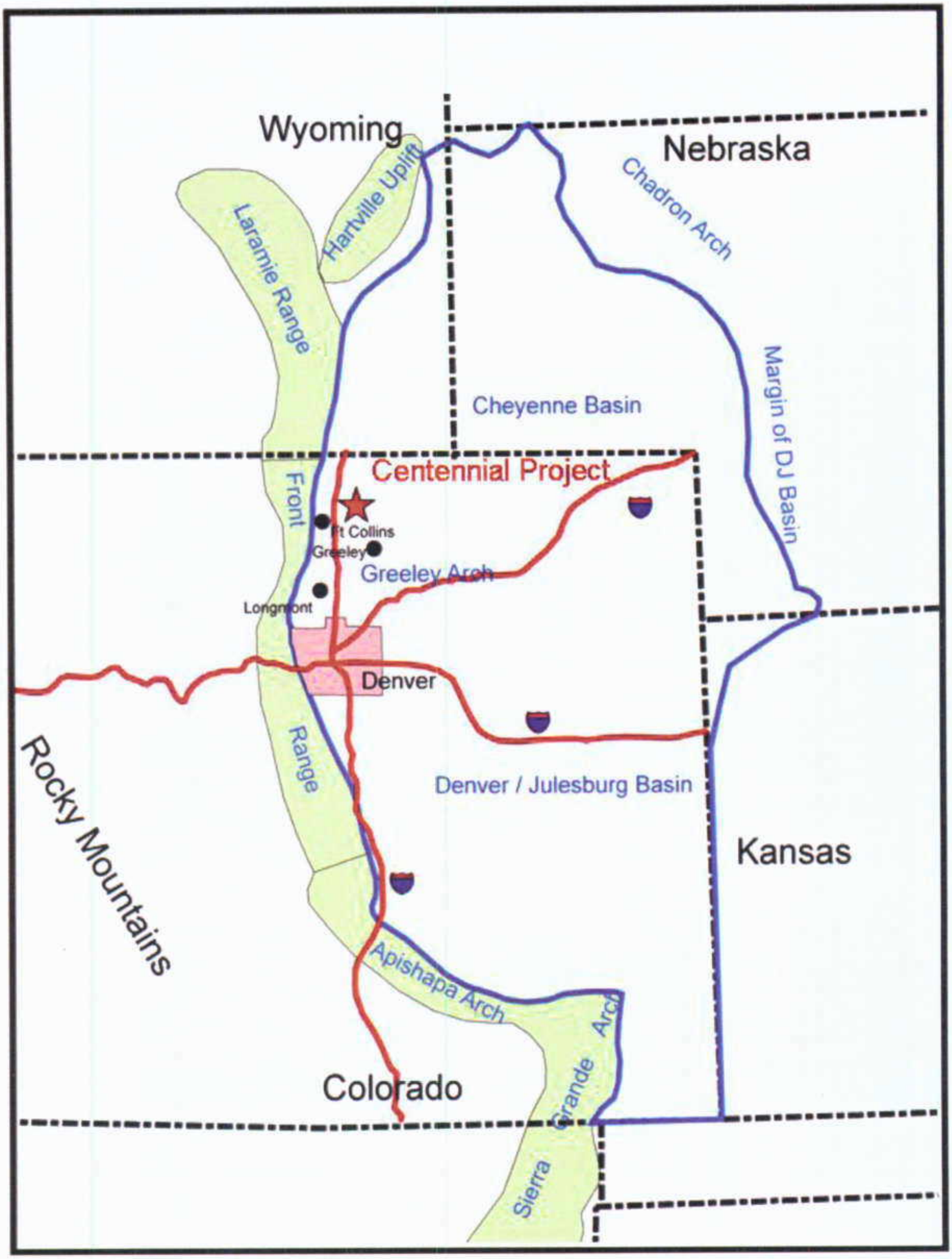

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Figure 2
Regional Map of the Denver–Julesburg Basin

Project: 321–5	Date: January 2009
PUC_RPTP_Figure_2	By: KRS / Checked: RLH

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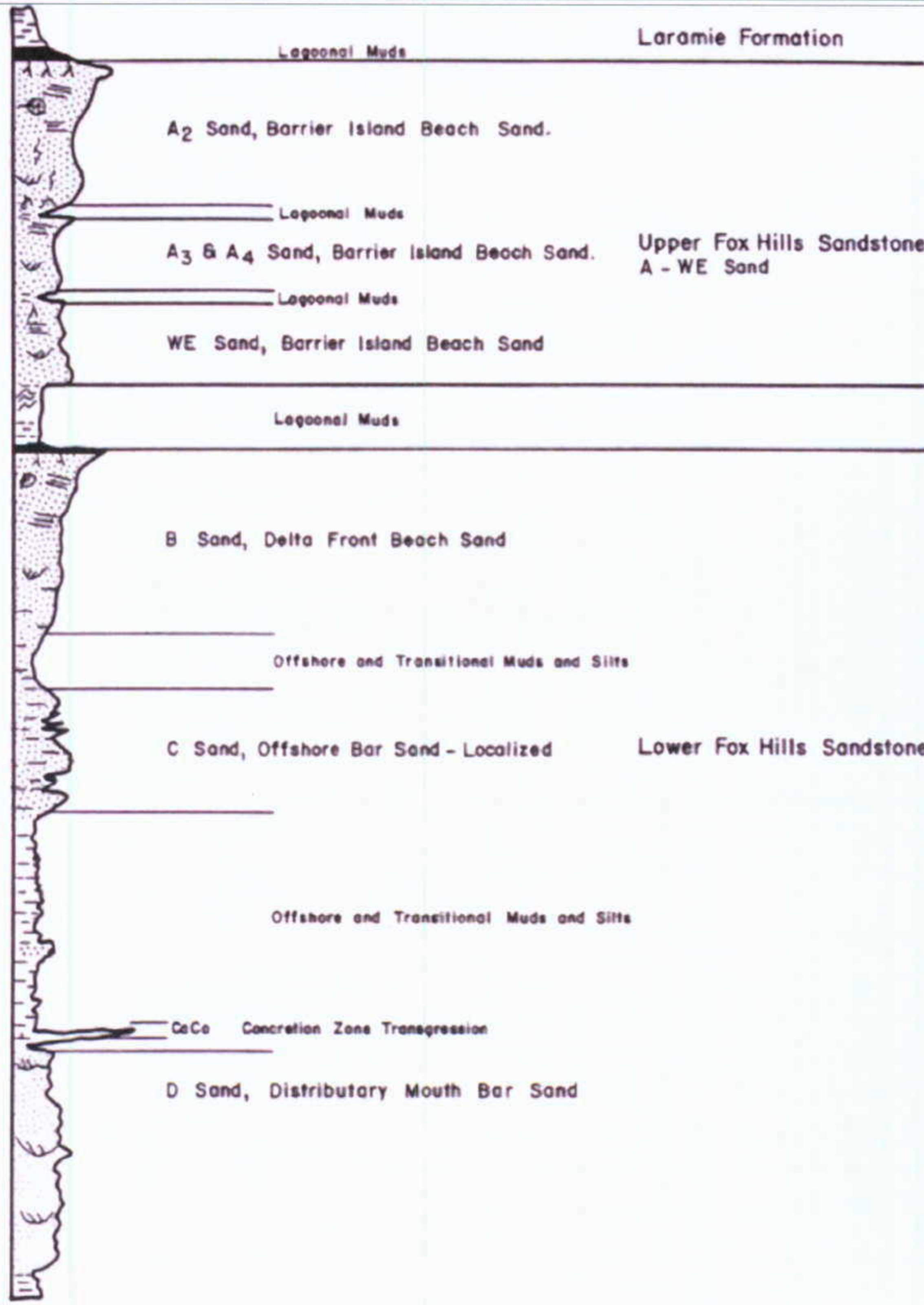

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Figure 3
Generalized Stratigraphic Section

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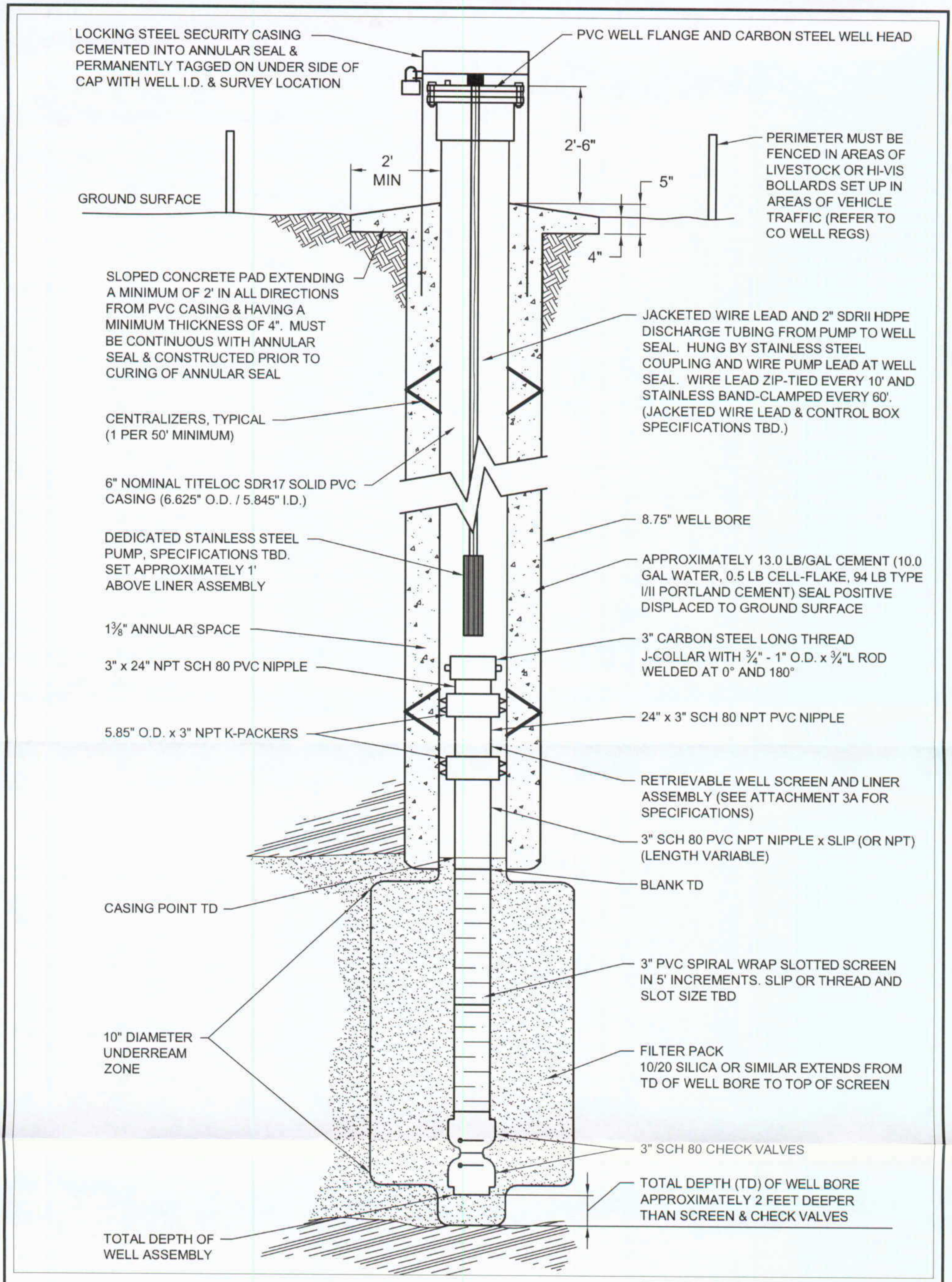

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Figure 5
Proposed Well Construction Detail

Project: 321-5	Date: January 2009
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