

**STATE OF UTAH**  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

FORM 3

AMENDED REPORT

<b>APPLICATION FOR PERMIT TO DRILL</b>		<b>1. WELL NAME and NUMBER</b> GORDON CREEK STATE NE 21-14-8
<b>2. TYPE OF WORK</b> DRILL NEW WELL <input checked="" type="checkbox"/> REENTER P&A WELL <input type="checkbox"/> DEEPEN WELL <input type="checkbox"/>		<b>3. FIELD OR WILDCAT</b> DRUNKARDS WASH
<b>4. TYPE OF WELL</b> Gas Well      Coalbed Methane Well: YES		<b>5. UNIT or COMMUNITIZATION AGREEMENT NAME</b>
<b>6. NAME OF OPERATOR</b> GORDON CREEK, LLC		<b>7. OPERATOR PHONE</b> 403 453-1608
<b>8. ADDRESS OF OPERATOR</b> 1179 E Main #345, Price, UT, 84501		<b>9. OPERATOR E-MAIL</b> rironside@thunderbirdenergy.com
<b>10. MINERAL LEASE NUMBER (FEDERAL, INDIAN, OR STATE)</b> ML-51219	<b>11. MINERAL OWNERSHIP</b> FEDERAL <input type="checkbox"/> INDIAN <input type="checkbox"/> STATE <input checked="" type="checkbox"/> FEE <input type="checkbox"/>	<b>12. SURFACE OWNERSHIP</b> FEDERAL <input type="checkbox"/> INDIAN <input type="checkbox"/> STATE <input checked="" type="checkbox"/> FEE <input type="checkbox"/>
<b>13. NAME OF SURFACE OWNER (if box 12 = 'fee')</b>		<b>14. SURFACE OWNER PHONE (if box 12 = 'fee')</b>
<b>15. ADDRESS OF SURFACE OWNER (if box 12 = 'fee')</b>		<b>16. SURFACE OWNER E-MAIL (if box 12 = 'fee')</b>
<b>17. INDIAN ALLOTTEE OR TRIBE NAME (if box 12 = 'INDIAN')</b>	<b>18. INTEND TO COMMINGLE PRODUCTION FROM MULTIPLE FORMATIONS</b> YES <input type="checkbox"/> (Submit Commingling Application) NO <input checked="" type="checkbox"/>	<b>19. SLANT</b> VERTICAL <input checked="" type="checkbox"/> DIRECTIONAL <input type="checkbox"/> HORIZONTAL <input type="checkbox"/>

20. LOCATION OF WELL	FOOTAGES	QTR-QTR	SECTION	TOWNSHIP	RANGE	MERIDIAN
LOCATION AT SURFACE	1958 FNL 800 FEL	SENE	21	14.0 S	8.0 E	S
Top of Uppermost Producing Zone	1958 FNL 800 FEL	SENE	21	14.0 S	8.0 E	S
At Total Depth	1958 FNL 800 FEL	SENE	21	14.0 S	8.0 E	S

<b>21. COUNTY</b> CARBON	<b>22. DISTANCE TO NEAREST LEASE LINE (Feet)</b> 800	<b>23. NUMBER OF ACRES IN DRILLING UNIT</b> 40
<b>25. DISTANCE TO NEAREST WELL IN SAME POOL (Applied For Drilling or Completion)</b> 1800	<b>26. PROPOSED DEPTH</b> MD: 3795 TVD: 3795	<b>29. SOURCE OF DRILLING WATER / WATER RIGHTS APPROVAL NUMBER IF APPLICABLE</b> 91-5205
<b>27. ELEVATION - GROUND LEVEL</b> 7171	<b>28. BOND NUMBER</b> RLB0010790	

Hole, Casing, and Cement Information										
String	Hole Size	Casing Size	Length	Weight	Grade & Thread	Max Mud Wt.	Cement	Sacks	Yield	Weight
Surf	11	8.625	142	24.0	J-55 Casing/Tubing	8.7	Class G	672	1.142	15.84
Prod	7.875	5.0	3795	17.0	N-80 LT&C	8.7	Class C	182	4.12	10.5
							Class C	109	2.39	11.5

**ATTACHMENTS**

VERIFY THE FOLLOWING ARE ATTACHED IN ACCORDANCE WITH THE UTAH OIL AND GAS CONSERVATION GENERAL RULES

<input checked="" type="checkbox"/> WELL PLAT OR MAP PREPARED BY LICENSED SURVEYOR OR ENGINEER	<input checked="" type="checkbox"/> COMPLETE DRILLING PLAN
<input type="checkbox"/> AFFIDAVIT OF STATUS OF SURFACE OWNER AGREEMENT (IF FEE SURFACE)	<input type="checkbox"/> FORM 5. IF OPERATOR IS OTHER THAN THE LEASE OWNER
<input type="checkbox"/> DIRECTIONAL SURVEY PLAN (IF DIRECTIONALLY OR HORIZONTALLY DRILLED)	<input checked="" type="checkbox"/> TOPOGRAPHICAL MAP

<b>NAME</b> Barry Brumwell	<b>TITLE</b> Vice President-Operations	<b>PHONE</b> 403 453-1608
<b>SIGNATURE</b>	<b>DATE</b> 12/04/2012	<b>EMAIL</b> bbrumwell@thunderbirdenergy.com
<b>API NUMBER ASSIGNED</b> 43007503550000		<b>APPROVAL</b>

**Received: June 18, 2013**

**DRILLING PLAN and PROGRAM**

Attached to UDOGM Form 3

**GORDON CREEK, LLC.**

**GORDON CREEK ST NE-21-14-8**

SURFACE LOCATION: 1,958' FNL & 800' FEL

SE/4 of NE4 of Section 21-14S-8E

Carbon County, Utah

**1. SURFACE GEOLOGIC FORMATION**

Emery Sandstone Member of the Mancos Shale

**2. ESTIMATED TOPS OF IMPORTANT GEOLOGIC MARKERS**

Blue Gate Shale Member top: 1,419' KB

Lower Blue Gate Bentonite Marker: 3,188' KB

Ferron SS: 3,323' KB

Tununk Shale: 3,735' KB

**3. PROJECTED GAS & H<sub>2</sub>O ZONES**

It is anticipated that ground water may be encountered within the Emery Sandstone Member of the Mancos Shale. Any water encountered will be reported on a Form 7 "Report of Water Encountered During Drilling". All indications of usable water will be reported.

Casing & cementing will be done to protect potentially productive hydrocarbons, lost circulation zones, abnormal pressure zones and prospectively valuable mineral deposits.

Surface casing will be tested to 500 psi and the Production casing will be tested to 1,500 psi, with a minimum of 1 psi/ft of the last casing string setting depth.

**4. PROPOSED CASING AND CEMENTING PROGRAMS**

Refer to EXHIBIT "A" for casing design information

**A. CASING PROGRAM**

HOLE SIZE (in)	CASING SIZE (in)	WEIGHT (#/ft)	GRADE	JOINT	DEPTH SET (ft)
14 <sup>3</sup> / <sub>4</sub>	12 <sup>3</sup> / <sub>4</sub>	40.5	H-40	ST&C	0 - 40
11	8 <sup>5</sup> / <sub>8</sub>	24.00	J-55	ST&C	0 - 1,425
7 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	17.00	N-80	LT&C	0 - 3,795

## **B. CEMENTING PROGRAM**

The 8 5/8" surface casing will be set and cemented full length with approximately 672 sacks of 0-1-0 Class "G" cement + 2% CaCl<sub>2</sub> + 0.25 #/sk of cellophane flakes mixed at 15.84 ppg (yield = 1.142 ft<sup>3</sup>/sk); volume based on nominal hole size + 100% excess. The cement will be circulated back to surface. In the event that the cement is not circulated back to surface, a 1" top out job will be performed with 0-1-0 Class "G" cement + 2% CaCl<sub>2</sub> + 0.25 #/sk of cellophane flakes mixed at 15.84 ppg (yield = 1.142 ft<sup>3</sup>/sk).

The 5 1/2" production casing will be set and cemented full length using a MINIMUM of 182 sx of LEAD CEMENT incorporating 2% Gypsum-60 + 0.25 #/sk of Superflake + 2% Super Sil SP mixed at 10.5 ppg (yield = 4.12 ft<sup>3</sup>/sk); cement volume based on nominal hole size + 100% excess, followed by a MINIMUM of 109 sx of HIGH EARLY COMPRESSIVE STRENGTH TAIL CEMENT incorporating 2% Gypsum-60 + 0.25 #/sk of Superflake + 2% Super Sil SP mixed at 11.5 ppg (yield = 2.39 ft<sup>3</sup>/sk); cement volume based on nominal hole size + 50% excess over the bottom 1000' of hole.

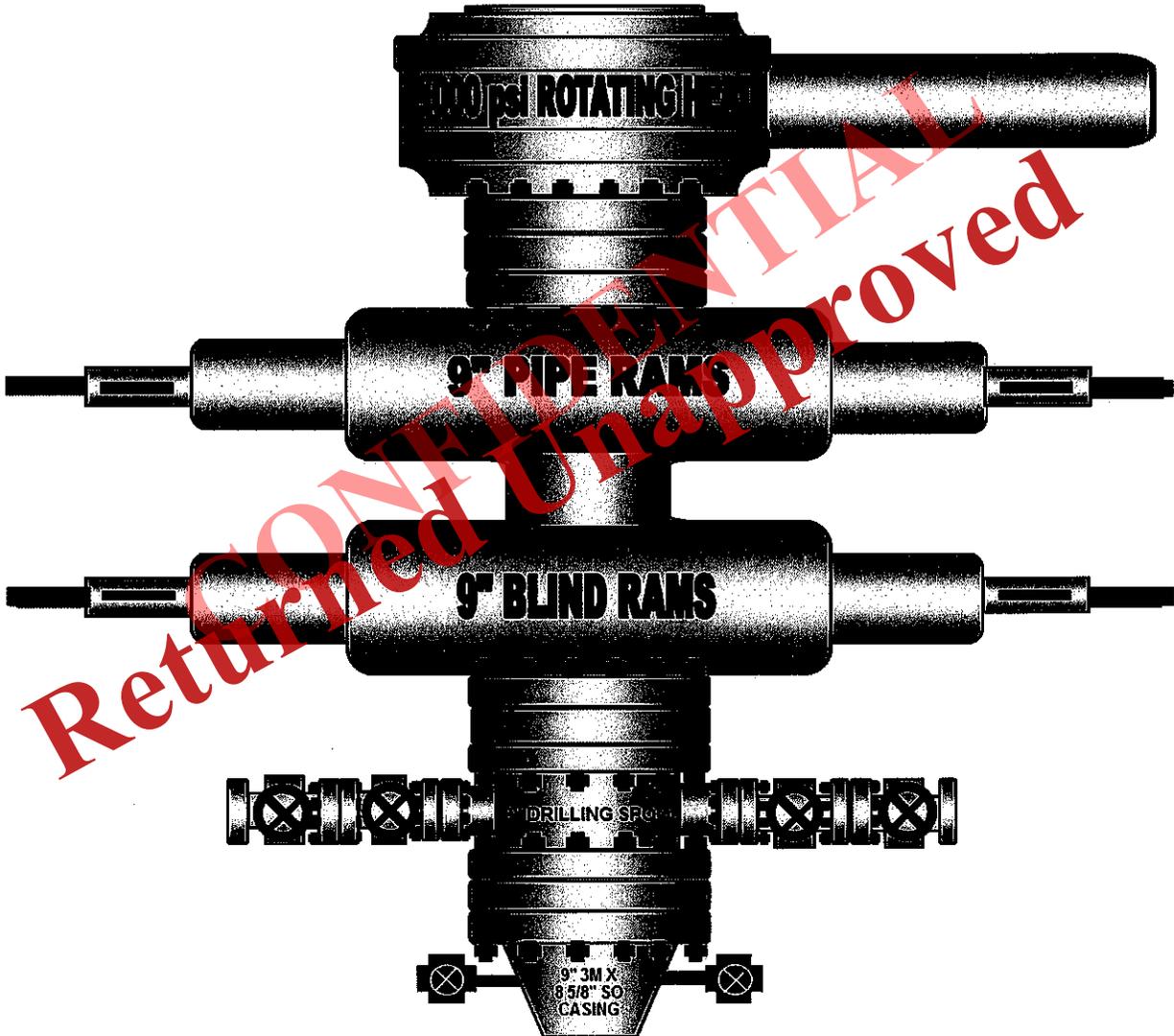
It is our intention for the cement mixture to be circulated back to surface, *IF POSSIBLE*.

### **THE FOLLOWING SHALL BE ENTERED INTO THE DRILLER'S LOG:**

- I. Blowout preventer pressure tests, including test pressures and results;
- II. Blowout preventer tests for proper functioning;
- III. Blowout prevention drills conducted;
- IV. Casing run, including size, grade, weight, and depth set;
- V. How the pipe was cemented, including amount of cement, type, whether cement was circulated back to surface, location of the cementing tools, etc.;
- VI. Waiting on cement time for each casing string;
- VII. Casing pressure tests after cementing, including test pressures and results.

**5. THE OPERATOR'S MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL**

Below is a schematic diagram of the blowout preventer equipment requirements for this drilling operation. A 9' X 3,000 psi double gate BOP will be used with a 2,000 psi Rotating Head utilized for air drilling operations. ALL BOPE will be pressure tested to the required operating pressures of each component. All tests will be recorded in the Driller's Report Book. The physical operation of each component of the BOP's will be checked on each trip.



**6. THE TYPE AND CHARACTERISTICS OF THE PROPOSED CIRCULATING FLUIDS / MUDS**

0' – 1,425'	11" Surface Hole	Drill with air, will mud-up if necessary.
1'425' – TMD	7 7/8" Main Hole	Drill with air, 500 psi @ 1500-2300 ft <sup>3</sup> /min

Will "mud up" at Total Depth to run logs and casing. Will mud up sooner if hole conditions dictate. It is anticipated that drilling fluid densities of 8.3 – 8.7 #/gal will be utilized when "mudded up".

**7. THE TESTING, LOGGING AND CORING PROGRAMS**

Open hole logs consisting of a CNL-LDT-GR-CAL will be run from above the Blue Gate Shale to TMD. A DIL-GR-SP log will be run from TMD to surface casing.

**8. ANY ANTICIPATED ABNORMAL PRESSURES or TEMPERATURES**

No abnormal pressures or temperatures have been noted or reported in wells drilled in the area nor at the depths anticipated in this well. Bottom hole pressure expected is approximately 900 psi maximum. No hydrogen sulfide or other hazardous gases or fluids have been found, reported or are known to exist at these depths in the area.

**9. ANTICIPATED STARTING DATE AND DURATION OF THE OPERATIONS**

The well will be drilled as soon as logistically possible after the APD Approval has been issued. Verbal and/or written notifications listed below shall be submitted in accordance with instructions from the Division of Oil, Gas & Mining:

- a) prior to beginning construction;
- b) prior to spudding;
- c) prior to running any casing or BOP tests;
- d) prior to plugging the well, for verbal plugging instructions.

Spills, blowouts, fires, leaks, accidents or other unusual occurrences shall IMMEDIATELY be reported to the Division of Oil, Gas & Mining.

## EXHIBIT "A"

### CASING DESIGN GORDON CREEK ST NE-21-14-8 PROJECTED TD: 3,795' KB

#### SURFACE CASING (0' – 1,425')

Diameter	8 <sup>5</sup> / <sub>8</sub> "
Interval	1,425' to Surface
Weight	24 #/ft
Grade	J-55
Coupling	ST&C

#### Burst Design

The recommended practice is to base the burst rating of the casing string in psi to be at least numerically equal to 0.225 psi/ft times the setting depth in feet of the next casing string. The rating chosen was also intended to match the BOPE pressure rating and exceed the highest possible surface pressure of approximately 936 psig.

Burst required =	$0.225 \times 3,795$	854 psig
Burst rating of casing string:	2,950 psi	
<b>Safety factor =</b>	<b><math>2,950 \text{ psi} / 854 \text{ psi} =</math></b>	<b>3.45</b>

#### Collapse Design

Collapse pressure is negligible on this surface string.

#### Tension Design

String weight in air = 24 #/ft X 1,425' =	34,200 #
Tensile strength of joint	244,000 lbf
Safety factor of joint	7.13

## PRODUCTION CASING (0' – 3,795')

Diameter	5 ½"
Interval	3,795' to surface
Weight	17 #/ft
Grade	N-80
Coupling	LT&C

### Burst Design

An internal pressure gradient of 0.4863 psi/ft has been used as a basis for these calculations. This gradient is equivalent to the force exerted by 10 ppg drilling fluid, which is a much higher density of fluid than we anticipate being required to drill this well.

Burst rating of casing string:	7,740 psi	
Burst rating required:	3,795' X 0.4863 =	1,846 psig
<b>Safety factor =</b>	<b>7,740 psi / 1,846 psi =</b>	<b><u>4.19</u></b>

### Tension Design

1.6 Safety factor of top joint, neglecting buoyancy and without over pull.

Tensile rating of casing joint:	348,000 lbf	
String Weight:	3,795' X 17 #/ft =	64,515 lbf
<b>Safety factor =</b>	<b>348,000 lbf / 64,515 lbf =</b>	<b><u>5.39</u></b>

### Collapse Design

Maximum anticipated mud weight is 10.0 ppg based on a mud gradient of 0.53 psi/ft.

Collapse rating of csg string:	6,280 psi	
Collapse rating required:	3,795 X 0.53 psi/ft =	2,011 psi
<b>Safety factor =</b>	<b>6,280 psi / 2,011 psi =</b>	<b><u>3.12</u></b>

### Production Casing Design

Interval (ft)	Weight (#/ft)	Grade	S.F. Burst	S.F. Collapse	S.F. Tension
3,795' – 0'	17	N-80	4.19	5.39	3.12

**MULTI-POINT SURFACE USE PLAN**

Attached to UDOGM Form 3

**GORDON CREEK, LLC.**

**GORDON CREEK ST NE-21-14-8**

**SURFACE LOCATION: 1,958' FNL & 800' FEL**

**SE/4 of NE4 of Section 21-14S-8E**

**Carbon County, Utah**

**1. EXISTING ROADS**

- a. We do not plan to change, alter or improve upon ANY existing State or County roads.
- b. Existing roads will be maintained in the same or better condition.

**2. PLANNED ACCESS**

- a. Access will be off of Benches Road in Section 28-14S-8E and travel NE through Section 28 (SITLA SURFACE) on a newly constructed roadway. ALL Surface Use Agreements are in place and paid up for the planned roadway. The roadway will follow existing 2-track trails wherever possible, and is planned with minimal impact to the terrain.
- b. If the well is productive, the road will be maintained as necessary to prevent soil erosion and maintain year-round traffic. However, we may allow the access road to be gated and closed off during winter production operations and access the site with a snowmobile or other winter ATV.
- c. Maximum Width: 20' travel surface with 27' base.
- d. Maximum grade: 25%
- e. Road culverts may be required. Surface water will be diverted around the well pad as necessary.
- f. Any power lines and / or pipelines to/from the well will follow the proposed access route.

**3. LOCATION OF EXISTING WELLS**

- a. As shown on the Civil Location Survey Plat for the well.

**4. LOCATION OF EXISTING and/or PROPOSED FACILITIES**

- a. If the well is a producer, installation of required production facilities will follow the drilling and completion phase of well operations. Buried flow lines, water lines and electrical cable will follow the proposed access road and other existing access ROWs to the intersection with Thunderbird's main 12' pipeline corridor.
- b. Rehabilitation of all pad areas not used for production facilities will be made in accordance with landowner stipulations.

**5. LOCATION AND TYPE OF WATER SUPPLY**

- a. All water to be used for drilling operations will be obtained from area water wells drilled and owned by Gordon Creek, LLC.
- b. Water will be transported to location by truck over approved access roads.

**6. SOURCE OF CONSTRUCTION MATERIALS**

- a. Any necessary construction materials needed will be obtained locally from a private source and hauled to the location on existing roads.
- b. No construction or surfacing materials will be taken from Federal / Indian lands.

**7. METHODS FOR HANDLING WASTE DISPOSAL**

- a. As shown on the Survey Plat, a 100' X 60' X 8' deep "mud pit" with liner will be constructed on the well pad to hold the drilled solids and drilling fluids required during the drilling operations phase of the well. Three sides of the reserve pit will be fenced within 24 hours after completion of construction and the fourth side within 24 hours after drilling operations cease with four strands of barbed wire, or woven wire topped with barbed wire to a height of not less than four feet. The fence will be kept in good repair while the pit is drying.
- b. As the majority of this well is expected to be air drilled, a small reserve "blooie" pit that drains into the main mud pit will be constructed with a minimum of one-half the total depth below the original ground surface on the lowest point within the pit. The pit will not be lined unless conditions encountered during construction warrant it or if deemed necessary by the DOGM Representative during pre-site inspection. Three sides of the reserve pit will be fenced within 24 hours after completion of construction and the fourth side within 24 hours after drilling operations cease with four strands of barbed wire, or woven wire topped with barbed wire to a height of not less than four feet. The fence will be kept in good repair while the pit is drying.
- b. Following drilling, the liquid waste will be evaporated from any pit and the pit backfilled and returned to natural grade. No liquid hydrocarbons will be discharged to the reserve pit or onto or off of the well pad.
- c. In the event that wellbore fluids are produced, any oil will be retained in tanks until sold and any water produced will be retained in the mud pit until its quality can be determined. The quality and quantity of the water will determine the method of disposal.
- d. Trash will be contained in a portable metal container and will be hauled from location periodically and disposed of at an approved disposal site. Chemical toilets will be placed on location and sewage will be disposed of at an appropriate disposal site.

**8. ANCILLARY FACILITIES**

- a. We anticipate no need for ancillary facilities with the exception of a personnel accommodation trailers with closed loop septic systems to be located on the drill site.

## **9. WELLSITE LAYOUT**

- a. Gordon Creek, LLC. has reduced to surface lease size (area stripped and levelled) for this location to the smallest lease size possible to accommodate the required drilling rig and support equipment.
- b. Any available topsoil will be removed from the location and stockpiled. The location of the rig, mud tanks, reserve and berm pits and all other drilling support equipment will be located as per common oilfield rig layouts.
- b. A blooie pit will be located 100' from the drill hole. A line will be placed on the surface from the center hole to the blooie pit. The blooie pit will not be lined, but will be fenced on four sides to protect livestock/wildlife.
- c. Access to the well pad will be as shown on the Civil Location Survey Plat for the well.
- d. Natural runoff will be diverted around the well pad.

## **10. PLANS FOR RESTORATION OF SURFACE**

- a. All surface areas not required for producing operations will be graded to as near original condition as possible and contoured to minimize possible erosion.
- b. Available topsoil will be stockpiled and will be evenly distributed over the disturbed areas and the area will be reseeded as prescribed by the landowner.
- c. Pits and any other area that would present a hazard to wildlife or livestock will be fenced off when the rig is released and removed.
- d. Rehabilitation will commence following completion of the well. Rat and mouse holes will be filled in immediately upon release of the drilling rig from the location. If the well site is to be abandoned, all disturbed areas will be re-contoured to the natural terrain found prior to location construction.

## **11. SURFACE OWNERSHIP**

- a. The well site and access road are on and across lands owned through the State of Utah School and Institutional Trust Lands Administration and covered by Surface Use Agreement # ML-51219. The operator shall contact the landowner and the Division of Oil, Gas and Mining 48 hours prior to beginning construction activities.

## **12. OTHER INFORMATION**

- a. The primary surface use is wildlife habitat and/or cattle grazing. The nearest dwelling is approximately 16.7 miles east (Price, Utah).
- b. If there is snow on the ground when construction begins, it will be removed before the soil is disturbed and piled downhill from the topsoil stockpile location.
- c. The back-slope and fore-slope will be constructed no steeper than 4:1.
- d. All equipment and vehicles will be confined to the access road and well pad.

- e. A complete copy of the approved Application for Permit to Drill (APD,) including all conditions and stipulations shall be on the well-site during construction and drilling operations.

There will be no deviation from the proposed drilling and/or workover program without prior approval from the Division of Oil, Gas & Mining.

**13. COMPANY REPRESENTATIVE**

Barry Brumwell, C.E.T.  
Vice President, Operations  
Gordon Creek LLC., a wholly owned subsidiary of  
Thunderbird Energy Corp.  
#800, 555 – 4<sup>th</sup> Avenue S.W.  
Calgary, Alberta, Canada T2P-3E7  
(403) 453-1608 (office)  
(403) 818-0696 (mobile)  
[bbrumwell@thunderbirdenergy.com](mailto:bbrumwell@thunderbirdenergy.com)

**14. CERTIFICATION**

I hereby certify that I, or persons under my direct supervision have inspected the proposed drill site and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct, and that the work associated with the operations proposed herein will be performed by Gordon Creek, LLC. and its subcontractors in conformity with this plan and the terms and conditions under which it is approved.

12/03/2012  
DATE

  
Barry Brumwell, C.E.T.  
Vice President, Operations  
Gordon Creek LLC. / Thunderbird Energy Inc.



7 7/8" MAIN HOLE TO BE DRILLED WITH AIR

Survey Grd. Ele: 7,171.4'  
Est. KB Elev: 7,183.4'  
KB - GRD used: 12.0' KB

8.625" Casing  
Set @ 1,425'

TOPS ft TVD

Emery Fm. @ SFC.

BASE OF GROUNDWATER TBD

Blue Gate Shale Mbr \*\* 1,419'

SURFACE CASING 1,425'

MUD UP WITH 3% KCl POLYMER  
DRILLING FLUID ONLY IF WATER INFLUX  
OCCURS OR TIGHT HOLE CONDITIONS  
OCCUR

Begin taking samples on  
Geologists orders

\* PRIMARY ZONE OF INT.  
\*\* SECONDARY ZONE

Lower Bluegate  
Bentonite Marker 3,188'

FERRON SS \* 3,323'  
(800 psi bhp)

Ferron Basal Marine SS 3,593'

Tununk Shale 3,735'

TD 3,795'

BOP'S  
9", 3000 #  
CASING  
BOWL

11" Surface  
Hole

7.875" Main  
Hole

5.500" CASING  
SET AT  
3,795'

SWEET WELL (NO H<sub>2</sub>S)

CASING DESIGN

	Interval (ft)	O.D. (Inches)	#/ft	Grade	Thread	Burst/Collapse (psi)	Joint Yield (lbs)	Opt.Torque (ft lbs)
Surface:	0 - 1,425	8 5/8	24	J-55	ST&C	2,950 / 1,370	244,000	2,440
Main:	0 - 3,795'	5 1/2	17	N-80	LT&C	7,740 / 6,280	348,000	3,480

ENSURE THAT MARKER JOINTS ARE PLACED IN THE CASING STRING OPPOSITE ANY PAY ZONE

TARGET: FERRON SANDSTONE/COAL; CASING TO BE CUT 18" ABOVE CASING BOWL

CEMENTING PROGRAM - Primary - Single Stage

	BIT Size (Inches)	Cement	Additives	Yield (ft <sup>3</sup> /sk)	Volume (sx)	% Excess	Cmt Top (ft)	Density (#/gal)
Surface:	11	0-1-0 "G"	2% CaCl <sub>2</sub> + Cellophane flakes	1.142	672.0	100	SFC	15.84
Main:	7 7/8	LEAD	2% Gypsum-50 + 0.25 #/sk SuperFlake + 2% Super SI-SP	4.12	182.0	100	SFC	10.50
		TAIL	High Early Compressive + 2% Gypsum-50 + 0.25 #/sk SuperFlake + 2% Super SI-SP	2.39	109.0	50	2,795	11.50

DRILLING FLUIDS

Interval	Type	NOTES
Surface: 0 - 1,425'	AIR	Drill with air, switch over to 3% KCl Polymer water if water influx overcomes air hammer.
	3% KCl Polymer	Run gel sweeps if sloughing occurs; run Cedar Fibre LCM if losses occur. Condition mud thoroughly prior to POOH to run/cement casing
Main: 1,425' - 3,795'	AIR	Drill with air, switch over to 3% KCl Polymer water if water influx overcomes air hammer. Attempt to drop TD with Air, unless ROP in the Ferron is poor - then POOH and switch to PDC and 3% KCl drilling fluid.
	3% KCl Polymer	MUD UP with 3% KCl polymer drilling fluid ONLY if water influx overcomes air hammer OR if TIGHT HOLE conditions become prevalent.

11" SURFACE HOLE:

- Spud with an approved water well/surface casing rig and air drill to surface TD of +/- 1,425'. Set surface casing at least 50' below any water influx zone. Survey every 100'. **Ensure that the surface hole deviation does not exceed 3°.**
- NOTE: If water influx overcomes air hammer or becomes problematic, MUD UP with a 3% KCl Polymer drilling fluid. Refer to the Mud Program and the Cementing Program for further information.
- NOTE: Ensure the well is cemented to surface on both casing strings. Contact the Operations Supervisor if any casing string cement job does not obtain returns to surface.
- Move the Surface Hole drilling rig off of location once surface casing is set and cemented.

7 7/8" MAIN HOLE:

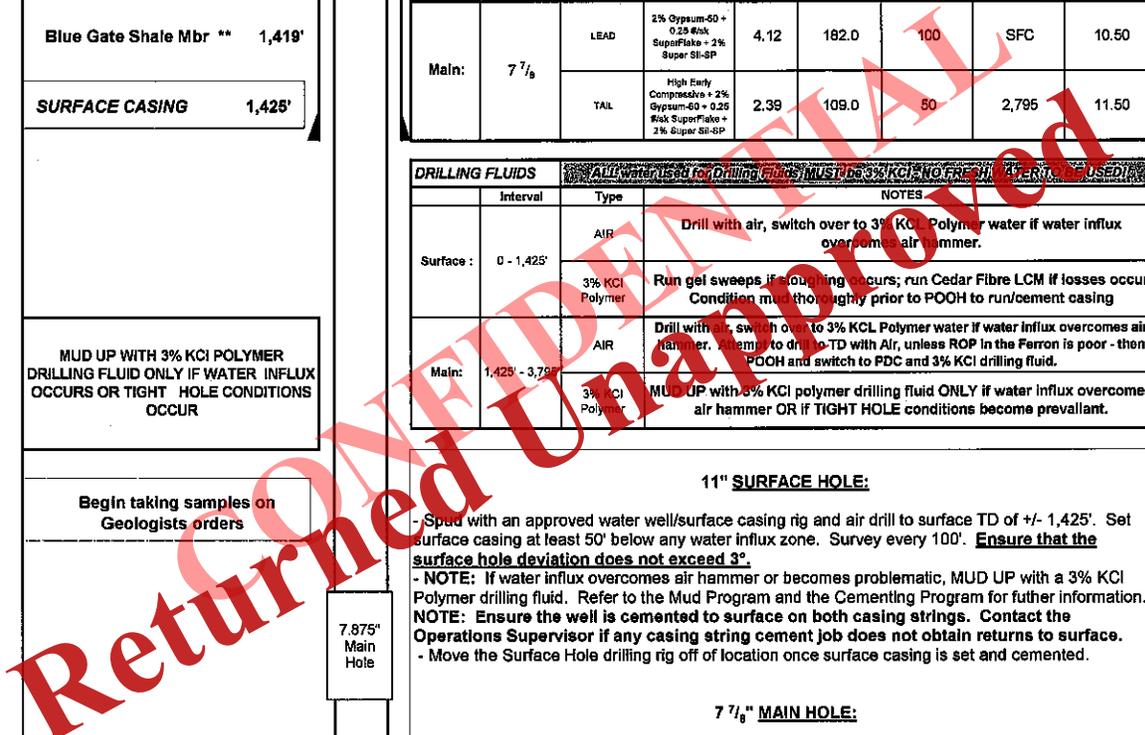
- Move on conventional drilling rig and drill out with air hammer assembly and AIR DRILL as far as possible with air. Survey every 300'. Ensure that deviation does not exceed 3°. Notify Calgary operations immediately if a 3° deviation is exceeded.
- TIGHT HOLE is possible on connections. REAM HOLE at first indication of tight hole and attempt to continue to air drill.
- COAL/SHALE SEAMS can occur in the wellbore which may be faulted and unconsolidated resulting in sloughing hole conditions.
- H<sub>2</sub>S WILL NOT be encountered.
- MUD UP with a 3% KCl Polymer drilling fluid ONLY if water Influx overrides the air hammer OR if tight hole conditions become prevalent.
- OVER PRESSURE: Generally, all zones in the wellbore should be underpressured (below normal water gradient) or have normal pressure gradients.
- LOST CIRCULATION should only have the potential to occur when drilling with fluids.
- ENSURE AND ADEQUATE AMOUNT OF LCM IS ON LOCATION AT ALL TIMES.
- FERRON SS/COAL PENETRATION - ATTEMPT TO AIR DRILL THROUGH THE FERRON ZONE. WATER may be encountered upon penetration. Ensure good hole conditions are prevalent to penetrating the FERRON.
- MUD UP - switch to a 3% Polymer drilling fluid system at Total Depth OR if water/tight hole problems occur.
- Mud Check - prior to POOH for logging, condition the mud and check mud properties with mudman. DO NOT POOH until the wellbore is circulating free of cuttings and the mud properties are optimal for logging.

SAMPLE REQUIREMENTS/ EVALUATION

T-BIRD	Begin taking 2 sets of samples every 10 feet at 2,600' to TD
GOVT:	As per regulations
Detection:	Gas detection/ PASON Mud Log as per Geologist's request.
Cores:	No coring
DST:	No DST's

LOGGING PROGRAM - DISCUSS SCALES REQUIRED WITH VP of GEOSCIENCES	# of copies
DIL-GR-SP T.D. to surface casing	4
CNL-LDT-GR-CAL T.D. to surface casing	4

Run a multi-arm calliper log to ensure correct calculation for cement volumes on casing or plugs.



**T14S, R8E, S.L.B.&M.**

**THUNDERBIRD ENERGY**

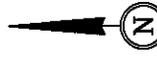
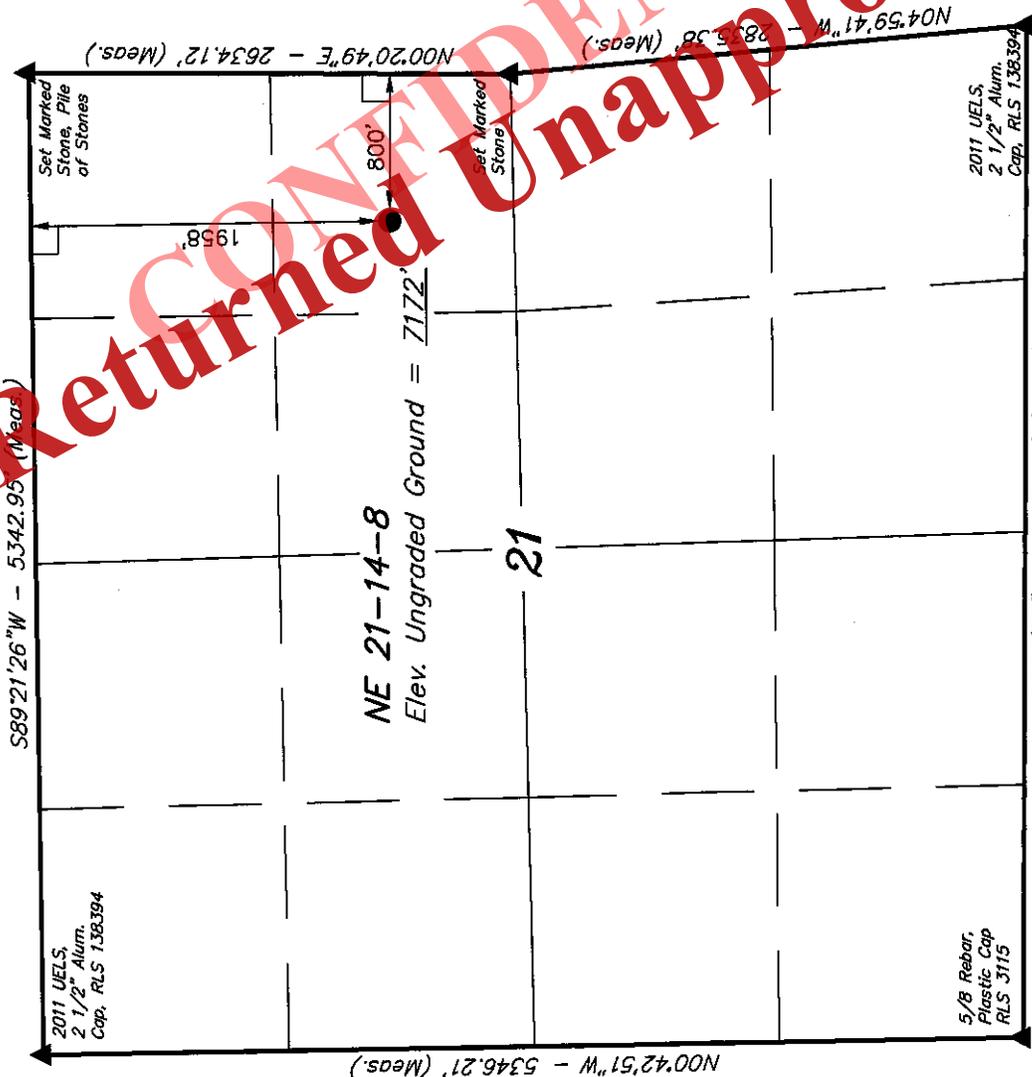
Well location, NE 21-14-8, located as shown in the SE 1/4 NE 1/4 of Section 21, T14S, R8E, S.L.B.&M., Carbon County, Utah.

**BASIS OF ELEVATION**

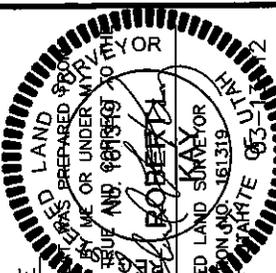
SPOT ELEVATION LOCATED AT THE NORTHWEST CORNER OF SECTION 34, T13S, R8E, S.L.B.&M., TAKEN FROM THE JUMP CREEK, QUADRANGLE, UTAH, CARBON COUNTY, 7.5 MINUTE QUAD. (TOPOGRAPHIC MAP) PUBLISHED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY. SAID ELEVATION IS MARKED AS BEING 7236 FEET.

**BASIS OF BEARINGS**

BASIS OF BEARINGS IS A G.P.S. OBSERVATION.



SCALE



CERTIFICATE

THIS IS TO CERTIFY THAT THE ABOVE FIELD NOTES OF ACTUAL SURVEYS MADE BY ME OR UNDER MY SUPERVISION AND THAT THE SAME ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

**UNTAH ENGINEERING & LAND SURVEYING**  
 65 SOUTH 200 EAST - VERNAL, UTAH 84078  
 (435) 789-1017

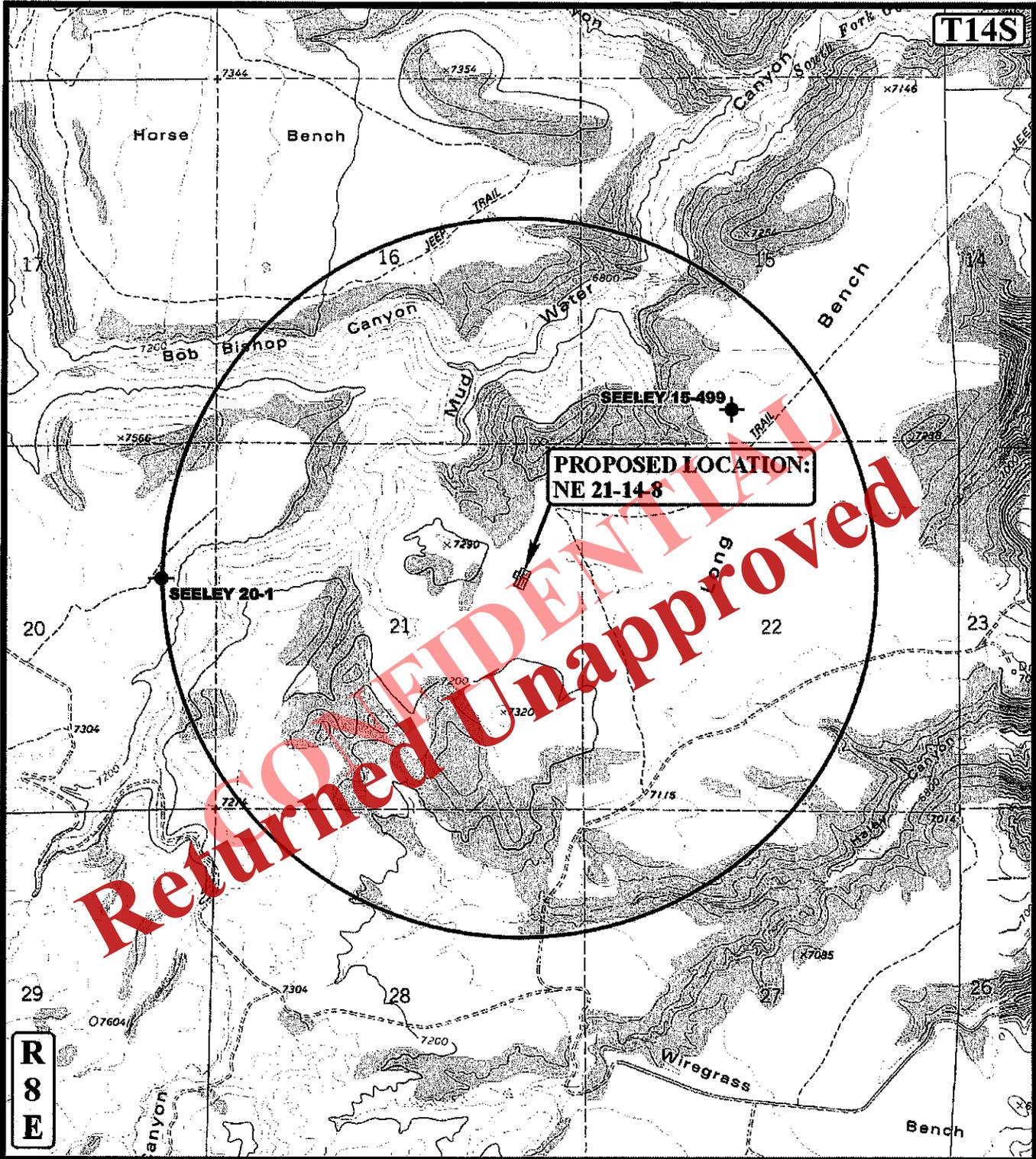
SCALE	DATE SURVEYED:	DATE DRAWN:
1" = 1000'	02-21-12	03-06-12
PARTY	REFERENCES	
B.H. N.F. N.S.	G.L.O. PLAT	
WEATHER	FILE	
COLD	THUNDERBIRD ENERGY	

NAD 83 (SURFACE LOCATION)
LATITUDE = 39°35'44.07" (39.5965575)
LONGITUDE = 111°01'33.70" (111.026028)
NAD 27 (SURFACE LOCATION)
LATITUDE = 39°35'44.20" (39.595611)
LONGITUDE = 111°01'31.10" (111.025306)

- LEGEND:**
- = 90° SYMBOL
  - = PROPOSED WELL HEAD.
  - ▲ = SECTION CORNERS LOCATED.

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T14S



R  
8  
E

**LEGEND:**

- DISPOSAL WELLS
- PRODUCING WELLS
- SHUT IN WELLS
- ABANDONED WELLS
- TEMPORARILY ABANDONED

**THUNDERBIRD ENERGY**

NE 21-14-8  
 SECTION 21, T14S, R8E, S.L.B.&M.  
 1958' FNL 800' FEL

**U&L** Uintah Engineering & Land Surveying  
 85 South 200 East Vernal, Utah 84078  
 (435) 789-1017 \* FAX (435) 789-1813



**TOPOGRAPHIC MAP** 03 08 12  
 MONTH DAY YEAR  
 SCALE: 1" = 2000' DRAWN BY: C.I. REVISED: 00-00-00

**C**  
 TOPO

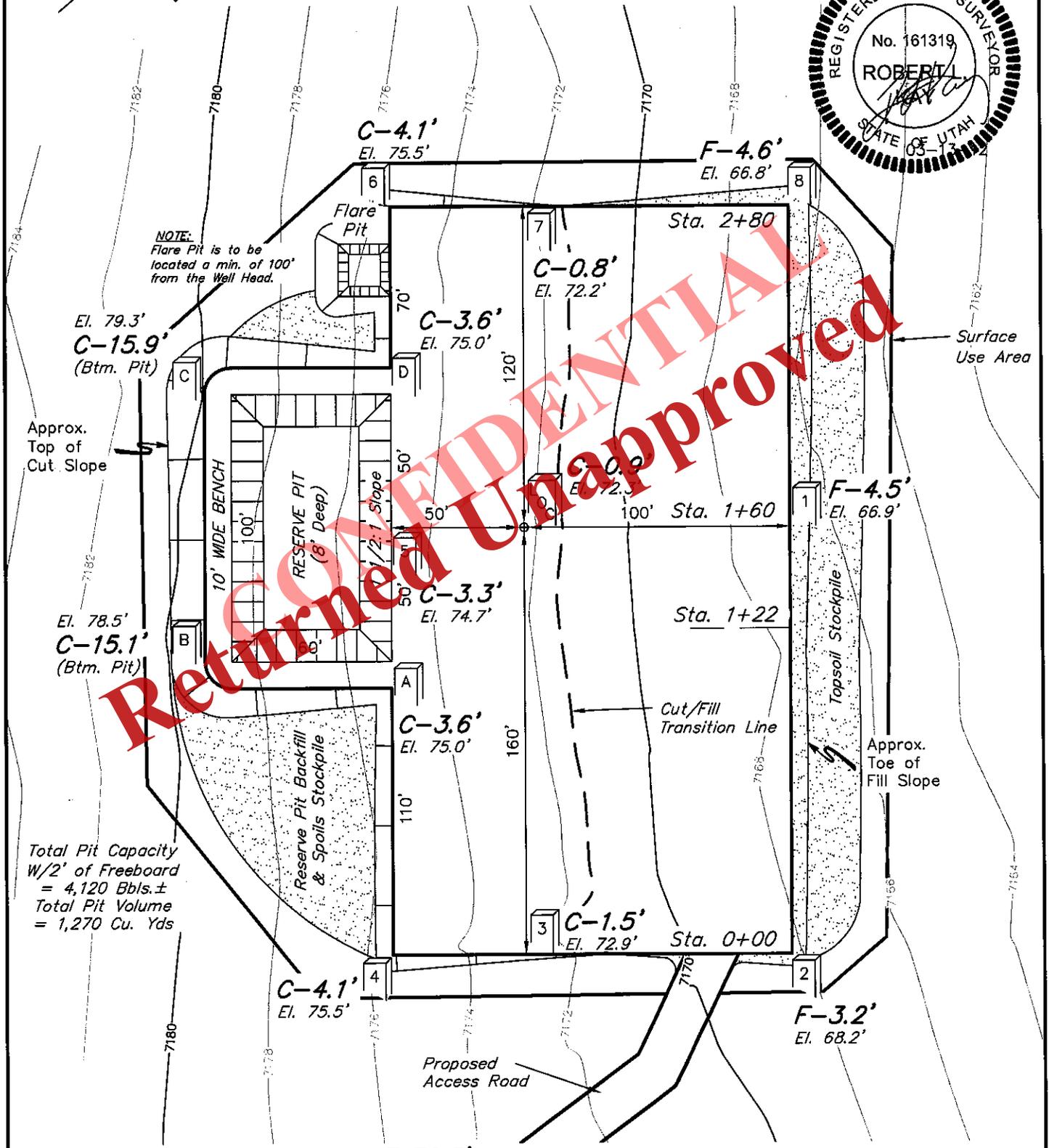
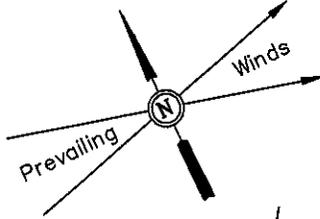
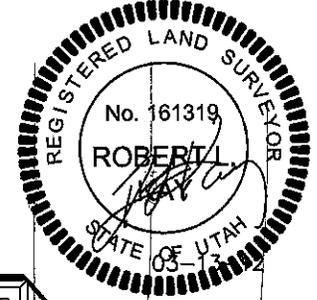
# THUNDERBIRD ENERGY

LOCATION LAYOUT FOR

NE 21-14-8  
SECTION 21, T14S, R8E, S.L.B.&M.  
1958' FNL 800' FEL

FIGURE #1

SCALE: 1" = 50'  
DATE: 03-07-12  
DRAWN BY: N.S.



Total Pit Capacity  
W/2' of Freeboard  
= 4,120 Bbbs.±  
Total Pit Volume  
= 1,270 Cu. Yds

Elev. Ungraded Ground At Loc. Stake = 7172.3'  
FINISHED GRADE ELEV. AT LOC. STAKE = 7171.4'

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**THUNDERBIRD ENERGY**

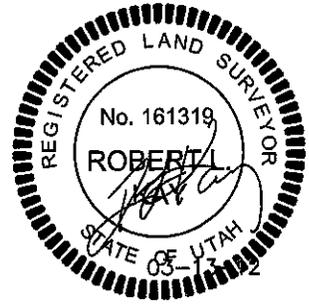
**TYPICAL CROSS SECTIONS FOR**

NE 21-14-8

SECTION 21, T14S, R8E, S.L.B.&M.

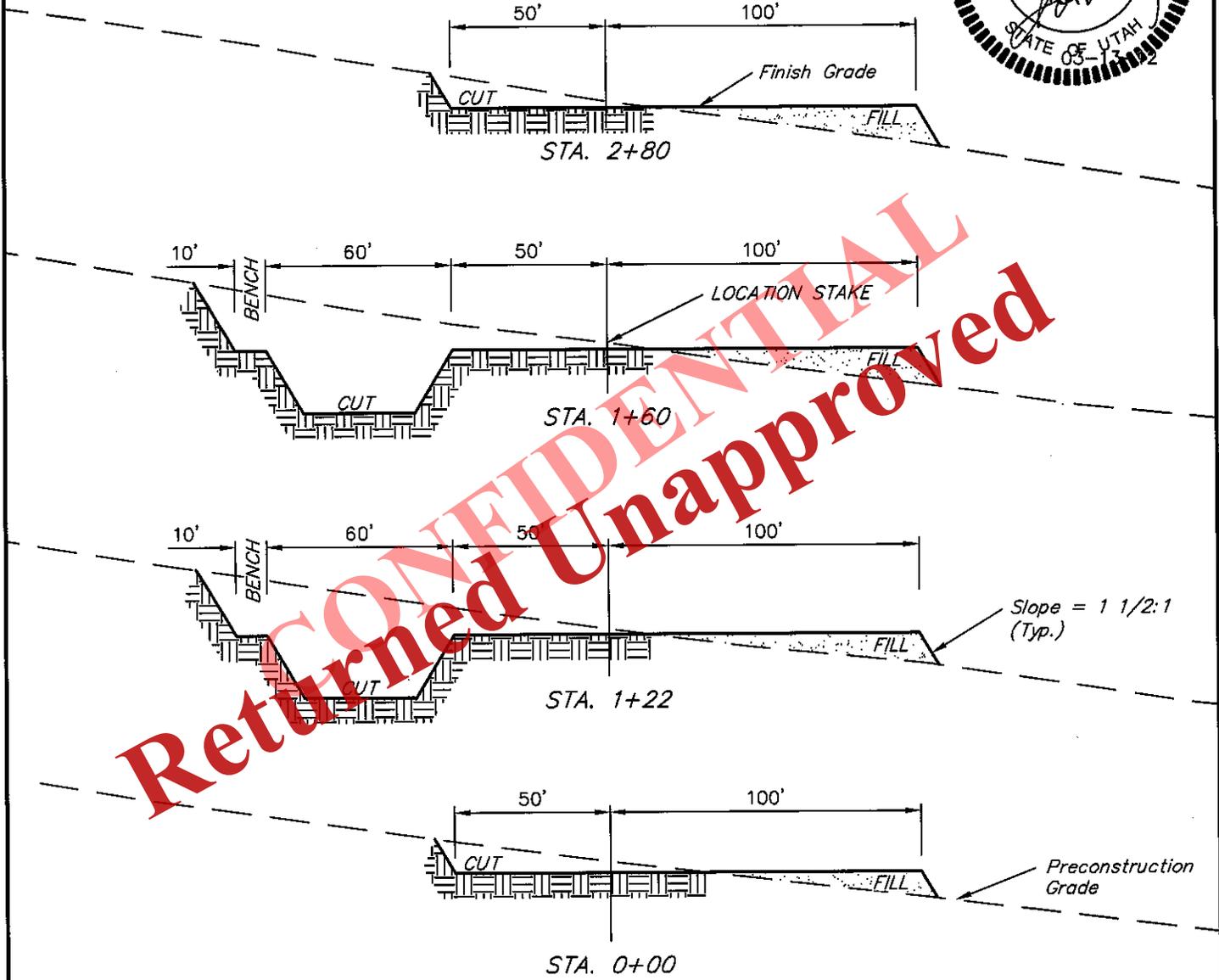
1958' FNL 800' FEL

**FIGURE #2**



X-Section Scale  
1" = 50'

DATE: 03-07-12  
DRAWN BY: N.S.



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**NOTE:**

Topsoil should not be Stripped Below Finished Grade on Substructure Area.

APPROXIMATE ACREAGES

WELL SITE DISTURBANCE = ± 1.868 ACRES  
 ACCESS ROAD &  
 PIPELINE DISTURBANCE = ± 1.140 ACRES  
 PIPELINE DISTURBANCE = ± 2.501 ACRES  
 TOTAL = ± 5.509 ACRES

**\* NOTE:**

FILL QUANTITY INCLUDES 5% FOR COMPACTION

APPROXIMATE YARDAGES

(6") Topsoil Stripping = 1,110 Cu. Yds.  
 Remaining Location = 4,350 Cu. Yds.  
**TOTAL CUT = 5,460 CU.YDS.**  
**FILL = 2,730 CU.YDS.**

EXCESS MATERIAL = 2,730 Cu. Yds.  
 Topsoil & Pit Backfill (1/2 Pit Vol.) = 1,750 Cu. Yds.  
 EXCESS UNBALANCE = 980 Cu. Yds. (After Interim Rehabilitation)

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# THUNDERBIRD ENERGY

## TYPICAL RIG LAYOUT FOR

NE 21-14-8

SECTION 21, T14S, R8E, S.L.B.&M.

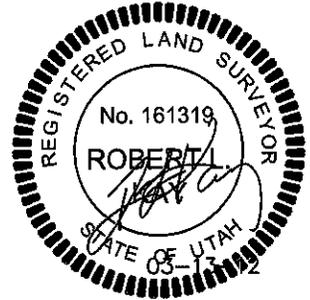
1958' FNL 800' FEL

FIGURE #3

SCALE: 1" = 50'

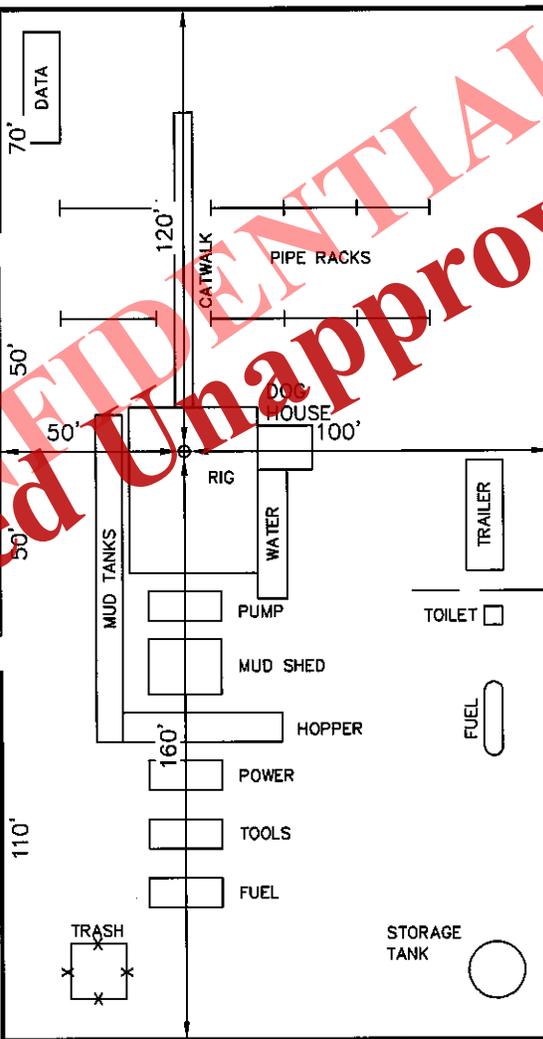
DATE: 03-07-12

DRAWN BY: N.S.



**NOTE:**  
Flare Pit is to be located a min. of 100' from the Well Head.

Flare Pit



10' WIDE BENCH

RESERVE PIT (8' Deep)

1/2:1 Slope

110'

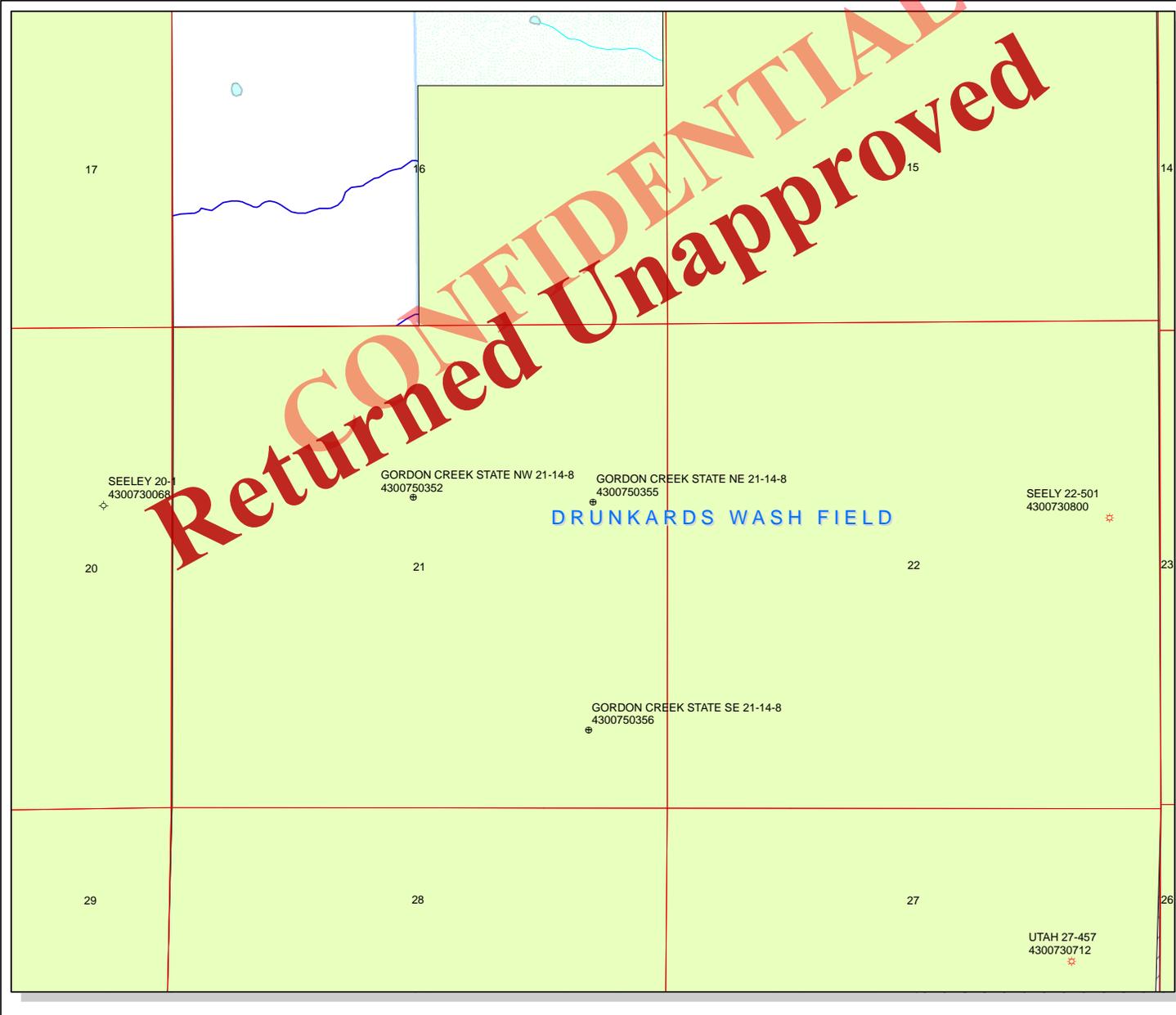
Total Pit Capacity  
W/2' of Freeboard  
= 4,120 Bbls.±  
Total Pit Volume  
= 1,270 Cu. Yds

Proposed Access Road

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85 So. 200 East \* Vernal, Utah 84078 \* (435) 789-1017

Received: December 04, 2012

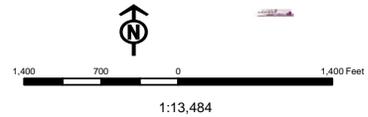
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**API Number: 4300750355**  
**Well Name: GORDON CREEK STATE NE 21-14-8**  
**Township T14.0S Range R08.0E Section 21**  
**Meridian: SLBM**  
**Operator: GORDON CREEK, LLC**

Map Prepared:  
 Map Produced by Diana Mason

- | Units         | Wells Query                        |
|---------------|------------------------------------|
| <b>STATUS</b> | <b>STATUS</b>                      |
| ACTIVE        | APD - Approved Permit              |
| EXPLORATORY   | DRL - Spudded (Drilling Commenced) |
| GAS STORAGE   | GIW - Gas Injection                |
| NF PP OIL     | GS - Gas Storage                   |
| NF SECONDARY  | LOC - New Location                 |
| P1 OIL        | OPS - Operation Suspended          |
| PP GAS        | PA - Plugged Abandoned             |
| PP GEOTHERML  | PGW - Producing Gas Well           |
| PP OIL        | POW - Producing Oil Well           |
| SECONDARY     | SGW - Shut-in Gas Well             |
| TERMINATED    | SOW - Shut-in Oil Well             |
| <b>Fields</b> | TA - Temp. Abandoned               |
| Unknown       | TW - Test Well                     |
| ABANDONED     | WDW - Water Disposal               |
| ACTIVE        | WW - Water Injection Well          |
| COMBINED      | WSW - Water Supply Well            |
| INACTIVE      | Bottom Hole Location - Oil/Gas/Dib |
| STORAGE       |                                    |
| TERMINATED    |                                    |





Diana Mason &lt;dianawhitney@utah.gov&gt;

---

**Re: New APDs**

---

**Barry Brumwell** <BBrumwell@thunderbirdenergy.com>

Tue, Jun 18, 2013 at 7:52 AM

To: Diana Mason &lt;dianawhitney@utah.gov&gt;

Yes please. Sorry Diana I guess that should have been obvious to me and I should have notified you.

Barry

Sent from my iPhone

On 2013-06-18, at 7:48 AM, "Diana Mason" <dianawhitney@utah.gov> wrote:

So on the one's that the lease expired, did you want us to return the permits?

On Mon, Jun 17, 2013 at 2:15 PM, Barry Brumwell <BBrumwell@thunderbirdenergy.com> wrote:

GORDON CREEK STATE SE 21-14-8 - our lease expired on Section 21  
GORDON CREEK STATE NE 27-13-8 - I don't know what the delay is  
GORDON CREEK STATE NW 21-14-8 - our lease expired on Section 21  
GORDON CREEK STATE NW 32-14-8 - SITLA wants us to move the Wellsite to a  
different location  
GORDON CREEK STATE NE 21-14-8 - our lease expired on Section 21

<image003.jpg>

**Barry Brumwell, C.E.T.**

Vice President, Operations

**Thunderbird Energy,**

**Gordon Creek, LLC.**

Suite 800, 555 – 4<sup>th</sup> Avenue S.W.

Calgary, Alberta, Canada

T2P 3E7

Office: (403) 453-1608, ext 224

Fax: (403) 453-1609

Cell: (403) 818-0696

US CELL: (623) 239-7982

[bbrumwell@thunderbirdenergy.com](mailto:bbrumwell@thunderbirdenergy.com)

**From:** Diana Mason [mailto:[dianawhitney@utah.gov](mailto:dianawhitney@utah.gov)]  
**Sent:** June-12-13 2:50 PM  
**To:** Barry Brumwell  
**Subject:** New APDs

Hi Barry,

All of these APDs were submitted back in December and is waiting on SIFLAs approval. Do you know what they are waiting on from Gordon Cree,, LLC?

- GORDON CREEK STATE SE 21-14-8
- GORDON CREEK STATE NE 27-13-8
- GORDON CREEK STATE NW 21-14-8
- GORDON CREEK STATE NW 32-14-8
- GORDON CREEK STATE NE 21-14-8

Thank you,

Diana

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image003.jpg  
4K



GARY R. HERBERT  
*Governor*

GREGORY S. BELL  
*Lieutenant Governor*

# State of Utah

## DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER  
*Executive Director*

### Division of Oil, Gas and Mining

JOHN R. BAZA  
*Division Director*

June 18, 2013

GORDON CREEK, LLC  
1179 E Main #345  
Price, UT 84501

Re: Application for Permit to Drill - CARBON County, Utah

Ladies and Gentlemen:

The Application for Permit to Drill (APD) for the GORDON CREEK STATE NE 21-14-8 well, API 43007503550000 that was submitted December 04, 2012 is being returned unapproved. If you plan on drilling this well in the future, you must first submit a new application.

Should you have any questions regarding this matter, please call me at (801) 538-5312.

Sincerely,

Diana Mason  
Environmental Scientist

Enclosure

cc: Bureau of Land Management, Vernal, Utah