



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

July 1, 2016

Leon Somsen
Quartz Operations, LLC
920 E. HWY. 50
Yankton, SD 57078

Re: Northern Points 1 Drill Permit

Dear Mr. Somsen:

The South Dakota Board of Minerals and Environment (the Board) held a public meeting on June 16, 2016. At that meeting, the Board directed the SD DENR to issue a Notice of Violation (NOV) pertaining to the Northern Points 1 well. Pursuant to that request, the enclosed NOV has been issued by the Department. It sets several action deadlines for Quartz: 1) If Quartz intends to contest the facts alleged within the NOV, Quartz must request a hearing within 30 days of receipt of this letter; 2) Quartz must submit a plugging plan for the Northern Points 1 well by September 1, 2016; and 3) Quartz must properly plug the Northern Points 1 well by October 31, 2016.

If Quartz fails to meet either the planning deadline or the plugging deadline stipulated in the NOV, the Board of Minerals and Environment will hold a contested case hearing on November 17, 2016 to consider action in regard to the Northern Points 1 well, including but not limited to: acting upon the plugging and performance bond, permit revocation, and pursuit of civil penalties pursuant to SDCL 45-9-68.

Please contact Bob Townsend or Mike Lees, DENR Minerals and Mining Program, at 605-773-4201 if you have questions regarding the NOV.

Sincerely,

Steven M. Pirner
Secretary

Enclosure

Cc: Mark Ekse, Hagen, Wilka & Archer, LLP, 600 S Main Suite 102, Sioux Falls, SD 57104

STATE OF SOUTH DAKOTA

SECRETARY OF THE

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

IN THE MATTER OF QUARTZ OPERATIONS')
FAILURE TO PROPERLY PLUG THE)
NORTHERN POINTS 1 WELL)

NOTICE OF VIOLATION
AND
ORDER

NOTICE OF CONTESTED
CASE HEARING

TO: Leon Somsen
Quartz Operations, LLC
920 E. HWY. 50
Yankton, SD 57078

The Secretary of the Department of Environment and Natural Resources (“Department”), pursuant to South Dakota Codified Laws (SDCL) 34A-10-16 hereby gives NOTICE that Quartz Operations, LLC, (“Quartz”), 920 E. HWY. 50, Yankton, SD, 57078 has violated conditions of its Application for Permit to Drill number 2026 and Administrative Rules of South Dakota (ARSD) 74:12:03:02(4)(a)(i), SDCL 45-6C, as specified below.

The FACTS alleged to constitute these violations are as follows:

1. Quartz Operations submitted two complete applications for permits to drill oil/gas wells at the following locations:

“NORTHERN POINTS 1” WELL: Located in the Northwest Quarter of the Northwest Quarter of Section 7, Township 1 North, Range 14 East, Pennington County, South Dakota;

And

“NORTHERN POINTS 2” WELL: Located in the Northeast Quarter of the Northeast Quarter of Section 12, Township 1 North, Range 13 East, Pennington County, South Dakota.

2. As part of the applications for the permits to drill, Quartz submitted a \$20,000 statewide Plugging and Performance Bond in accordance with SDCL 45-9-15.

3. The South Dakota Board of Minerals and Environment (“Board”) conducted a contested case proceeding to consider issuance of the two drilling permit applications identified in #1, above on March 21, 2013.
4. Based on the Department’s recommendation of conditional approval, the Board ordered the two drilling permits be issued with the following conditions:
 - a. Each permit is conditioned on compliance with all applicable requirements of SDCL Title 45-9 and ARSD Article 74:12.
 - b. That the operator shall submit additional surety bonds for each well to be held in addition to the \$20,000 Statewide Plugging and Performance Bond already submitted. The additional bond required for the first well is \$110,000 and for the second well, \$130,000. The form of the surety bond may be in the form of a certificate of deposit in the name of the Board of Minerals and Environment or a surety bond. The additional bond for each well must be submitted and approved by the Department before site preparation and drilling may begin.
 - c. The operator shall provide the Department with the name of the drilling contractor before the drilling commences.
 - d. A 12-mil woven, reinforced high-density polyethylene liner must be used for pits or cuttings storage areas.
 - e. Surface runoff must be diverted around the drill site.
 - f. The surface hole must be drilled with fresh water.
 - g. Cement must be circulated to the ground surface on the surface casing.
 - h. Vertical deviation survey results must be submitted to the department within 30 days of completion of the well pursuant to rule 74:12:02:15.
 - i. If production casing is set:

- (1). The casing and cementing program submitted with the application, including cementing the production casing from total depth to surface, shall be followed.
 - (2). A cement bond log must be run and filed with the department within 60 days of completion of the well as required by rule 74:12:02:12.
 - (3). A completion report must be submitted to the department within 30 days of completion of the well as required by rule 74:12:02:17.
- j. Technical reports and well logs must be submitted to the department as required by rule 74:12:02:17.
- k. If abandoned:
- (1). If production casing is left in the wellbore, a mechanical integrity test (MIT) must be conducted to verify the integrity of the casing as required by rule 74:12:03:02(4)(b)(ii).
 - (2). With production casing:
 - (a). A cast iron bridge plug and a 20-foot cement plug must be installed immediately above any perforations.
 - (b). If a portion of the production casing is retrieved, a 100-foot cement plug, half in and half out of the top of the casing stub after the retrievable part of the production casing has been removed, must be installed.
 - (c). A 100-foot cement plug, half in and half out of the top of the following formations: Deadwood, Red River, Interlake, Minnelusa, Minnekahta, and Inyan Kara, must be installed.
 - (d). A 100-foot cement plug, half in and half out of the base of the surface casing, must be installed.
 - (e). A 25-foot cement plug must be installed at the top of the surface casing.

- (3). Without production casing:
 - (a). 100-foot cement plugs must be installed, half in and half out of the top of the following formations: Deadwood, Red River, Interlake, Madison, Minnelusa, Minnekahta, and Inyan Kara.
 - (b). A 100-foot cement plug, half in and half out of the base of the surface casing, must be installed.
 - (c). A 25-foot cement plug must be installed at the top of the surface casing.
 - (d). Heavy, mud-laden fluid must be used between all open hole plugs.
- (4). The casing string must be cut off at least three feet below the final ground surface contour. A plate with the name of the operator, well name and number, and legal location by quarter-quarter section, township and range must be welded to the casing stub. The location of the abandoned well must be surveyed with high resolution global positioning system equipment or other appropriate survey methods sufficient to accurately locate the well. Survey coordinates must be included in the final abandonment report.
- (5). A plugging report must be submitted to the department within 30 days after plugging and abandonment operations are complete as required by rule 74:12:03:01.

- l. Surface reclamation of the site must be completed within one year of plugging and abandoning the well.

- m. A washed set of sample cuttings (or cores, if cut) must be shipped, free of charge, to:

Derric Iles

Geological Survey Program

Akeley-Lawrence Science Center

University of South Dakota

414 Clark Street

Vermillion, SD 57069-2390

5. Quartz submitted a certificate of deposit in the amount of \$110,000 on March 21, 2013 to cover plugging and performance liability for the Northern Points 1 well in accordance with condition 4.b., above.
6. The application for permit to drill number 2027 for the Northern Points 2 well was never utilized by Quartz, and expired on March 21, 2014 pursuant to ARSD 74:12:02:03.
7. Quartz constructed a drilling pad location for the Northern Points 1 well and commenced drilling the well on April 2, 2013.
8. Quartz lost drilling fluid circulation on the Northern Points 1 well after penetrating the Madison Formation at a depth of approximately 4,800 feet on April 12, 2013. Loss of circulation occurred as the drillstem penetrated zones of high porosity in the upper Madison Formation.
9. On April 17, 2013, while attempting to correct fluid circulation problems at the Northern Points 1 drill site, Quartz's drillstem became stuck in the borehole at a depth of approximately 2,800 feet.
10. Between April 17, 2013 and April 29, 2013, Quartz attempted to retrieve the stuck drillstem, but was unable to retrieve a section of drillstem approximately 150 feet in length. The stuck drillstem includes a drill bit, a mud motor, drill collars, and drill pipe lodged within the Northern Points 1 borehole between the depths of approximately 2,600 feet and 2,750 feet.
11. Quartz was unable to reenter the 2,106 feet of the Northern Points 1 open borehole that lie below the 150-foot section of stuck drillstem. Because Quartz was unable to reenter the

lower portion of the borehole, plugging the isolated section of borehole would require directional drilling around the stuck drillstem.

12. The open borehole that lies below the 150-foot section of stuck drillstem penetrates the Inyan Kara, Minnekahta, Minnelusa, and Madison aquifers and is not cased with production casing.
13. In accordance with ARSD 74:12:03:02(4)(a)(i), which pertains to plugging of wells without production casing, all aquifers, salt zones, and fluid-bearing formations must be sealed or separated with individual cement plugs, circulated to fill at least 100 feet of hole. Each individual cement plug must be at least 50 feet above the top of these formations, as specified by the secretary.
14. Condition 4.k.(3)(a) above requires placement of 100-foot cement plugs, half in and half out of the top of the Inyan Kara, Minnekahta, Minnelusa, and Madison aquifers.
15. Quartz submitted a Sundry Notice and Report on Wells on May 7, 2013 notifying the department of Quartz's intention to plug and abandon the Northern Points 1 well. The plugging plan described in the Sundry Notice consisted of placing cement plugs only in the upper portion of the Northern Points 1 borehole. The plugging plan did not make provision for plugging the 2,106 feet of uncased borehole lying below the stuck drillstem.
16. On May 7, 2013 Quartz informed the department by phone that Quartz did not have the financial resources necessary to plug the Northern Points 1 well in accordance with state rules.
17. On May 11, 2013 Quartz attempted to plug the upper 2,594 feet of the Northern Points 1 well, but was unable to accomplish its unapproved plugging plan because the borehole collapsed at a depth of approximately 1,030 feet.

18. On May 12, 2013 Quartz attempted to drill through the collapsed section of borehole at a depth of approximately 1,030 feet, but was unable to do so due to continued collapse of the borehole wall at depths between 1,000 and 1,100 feet. Subsequently, Quartz managed to plug only the upper 1,090 feet of the borehole by placing a cement plug between 795 and 1,090 feet in depth, and another plug from the surface to 70 feet in depth.
19. The Inyan Kara Aquifer in the vicinity of Northern Points 1 is characterized by good water quality with total dissolved solids ranging from approximately 500 to 800 parts per million, and is utilized as a municipal and domestic source of fresh water.
20. Based on regional water quality estimates, the Minnelusa Aquifer in the vicinity of the Northern Points 1 well is characterized by relatively poor water quality, with approximately 25,000 parts per million total dissolved solids.
21. Based on regional water level data, the potentiometric surface of the Minnelusa Aquifer is higher than the elevation of the Inyan Kara Aquifer in the vicinity of the Northern Points 1 well due to artesian pressure. Therefore, the unplugged portion of the Northern Points 1 wellbore provides a pathway for upward flow of poorer-quality Minnelusa ground water into the Inyan Kara Aquifer.
22. Failure to plug the Northern Points 1 well in accordance with condition 4.k.(3), above, is a violation of Quartz's drilling permit and ARSD 74:12:03:02(4)(a)(i).

ORDER

WHEREFORE, as a result of these FACTS and VIOLATIONS, and pursuant to SDCL 34A-10-16 the Secretary of the South Dakota Department of Environment and Natural Resources hereby ORDERS that the following corrective actions be taken by Quartz:

1. Quartz shall submit a plugging plan for the Northern Points 1 well to the department by September 1, 2016. The plan must include a budget and implementation schedule developed in consultation with a well services company approved by the department.
2. Quartz shall plug the Northern Points 1 well in accordance with Condition 4.k.(3)(a) of the application for permit to drill number 2026 and ARSD 74:12:03:02(4)(a)(i) by October 31, 2016.

NOTICE IS HEREBY GIVEN that this Notice of Violation is effective thirty days from its issuance, unless Quartz submits a written request for a hearing before the Secretary regarding the allegations. The written request must be filed before the expiration of thirty days, by delivery to: Secretary, Department of Environment and Natural Resources, 523 East Capitol Ave., Pierre, SD 57501-3182. NOTICE IS ALSO GIVEN THAT, should Quartz fail to request a hearing within that time, the allegations stated herein shall be deemed fact and the Notice of Violation shall be immediately effective.

NOTICE IS HEREBY GIVEN that if Quartz fails to meet either the planning deadline or the plugging deadline ordered above, the Board of Minerals and Environment will hold a contested case hearing on November 17, 2016 to consider action in regard to the Northern Points 1 well including but not limited to acting upon the plugging and performance bond, permit revocation, and pursuit of civil penalties pursuant to SDCL 45-9-68.

NOTICE IS ALSO HEREBY GIVEN that these violations, as well as a failure to comply with the provisions of the Order, may subject Quartz to injunctive legal action pursuant to SDCL 34A-10-2.5, and to legal action for civil penalties and for damages to the natural resources pursuant to SDCL 45-9-68.

This Notice of Violation does not constitute a waiver or election by the State to forego civil or criminal action of any kind, including actions to seek penalties or other relief as the State may deem appropriate under the provisions of SDCL Chapters 34A-10 and 45-9.

Dated and signed this 1st day of July, 2016.



Steven M. Pirner
Secretary
Department of Environment and Natural Resources