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January 9, 2013

Eric Holm
Natural Resources Engineer III
Minerals and Mining Program
South Dakota Department of Environment & Natural Resources
523 East Capitol Avenue
Joe Foss Building
Pierre, SD 57501-3182

Re: Response to December 14, 2012 Supplemental Completeness Comments
Dewey-Burdock Project Large Scale Mine Permit Application

Dear Mr. Holm:

On behalf of Powertech (USA) Inc., this letter is provided in response to the December 14, 2012 supplemental completeness comments for the above-referenced large scale mine (LSM) permit application. For convenience, the comments are provided below in italics along with the responses. Application replacement pages are enclosed along with an index of changes (three hard copies and one electronic copy on CD). The replacement pages are included as individual PDF files that correspond to the changes shown on the index of changes. For convenience, the enclosed CD also includes a folder with replacement pages incorporated into the application text and appendix files. Only files that were updated as a result of the comment responses are included.

Paper copies of the comment responses, change index and replacement pages are being submitted along with electronic copies of the attachment to the Custer County and Fall River County Register of Deeds, who received paper copies of the LSM permit application. Paper copies of the comment responses are being submitted along with electronic copies of the change index, replacement pages and attachment to the agencies who received electronic copies of the original application. The distribution list is provided at the end of this letter. All references to sections, figures, plates or appendices in the following comment responses refer to the LSM permit application submitted on September 28, 2012 unless indicated otherwise.

Procedural Completeness Items

1. *<u>SDCL 45-6B-6(4):</u> On several of the mineral leases, Kelsey Boltz and Rocky Mountain Services are listed as lessees. However, there is nothing in Attachment A which shows that either these leases have been transferred to Powertech or it has authority to mine under these leases. Please submit proof that Powertech has the legal authority to mine under these leases.*

Response: Documents showing assignment of mining leases from Kelsey Boltz and Rocky Mountain Land Services to Neutron Energy, Inc. are enclosed as Attachment 1. Documents showing assignment of these same leases from Neutron Energy, Inc. to Powertech were provided

in Attachment A to the December 3, 2012 comment response letter. The table below provides the page numbers in Attachment A showing assignment of applicable Neutron Energy, Inc. leases to Powertech.

Mineral Owner	Memorandum of Mining Lease Page No.[1]	Lessee Prior to Neutron Energy	Transfer from Neutron Energy to Powertech Page No.[1]
Barnard, Robert and Alice	A-11, A-12	Kelsey Boltz	A-96
Barnard, William and Joyce	A-13, A-14	Kelsey Boltz	A-96
Laesch Ellison, Barbara Jacqueline S.	A-24, A-25	Kelsey Boltz	A-98
Jozwik, Francis A. and Phyllis	A-32, A-33	Kelsey Boltz	A-96
Jozwik, Paul and Janet	A-34, A-35	Kelsey Boltz	A-96
Kellberg, Helen L. and Carl Leroy	A-36, A-37	Kelsey Boltz	A-98
Laesch, Carol A.	A-38, A-39	Kelsey Boltz	A-98
Laesch, Frederick and Marilyn	A-40, A-41	Kelsey Boltz	A-98
Laesch, Rev. Norman and Joyce	A-42, A-43	Kelsey Boltz	A-98
Laesch, Roger C. and Jeanette R.	A-44, A-45	Kelsey Boltz	A-97
Laesch, Steven and Elizabeth	A-46, A-47	Kelsey Boltz	A-97
Laesch, William J.	A-48, A-49	Kelsey Boltz	A-100
Lowham, Paul	A-52, A-53	Kelsey Boltz	A-97
Mueller, Rev. Richard and Irene	A-56-A-57	Kelsey Boltz	A-99
Viel, Christopher and Kelly	A-78, A-79	Kelsey Boltz	A-98
Wilson, Allen and Barbara	A-80, A-81	Rocky Mountain Land Services	A-100

[1] Page number(s) in Attachment A to the December 3, 2012 completeness response letter.

Also, in the supplement, Powertech states the mineral rights were reserved within the railroad right of way when it was constructed. Who currently holds the mineral rights within the right of way?

Response: Powertech has determined that when the railroad right-of-way was established, the owners of the mineral rights retained the mineral ownership within the right-of-way. Plate 2.2-1 and Appendix 2.2-A indicate the mineral ownership in these areas.

In addition, Kathleen Klausen was not updated to Kathleen Stritar in the table on page 2.2-A-2, in Appendix 2.2-A.

Response: Kathleen Klausen has been updated to Kathleen Stritar in the table of surface and mineral owners in Appendix 2.2-A.

2. *SDCL 45-6B-7(5), SDCL 45-6B-33(3), and ARSD 74:29:02:06: Please submit a map showing the 18 sites either on or eligible for inclusion on the National Register of Historic Places and the proposed affected areas. The map should be marked confidential.*

Response: The requested map will be sent by Powertech under a separate cover and marked confidential. While reviewing Section 3.11.2 of the LSM permit application, Powertech noticed that the density of cultural resources sites in the permit area was incorrectly listed as one site per 8.1 acres. Powertech has prepared a replacement page that indicates the correct density of one site per 48.8 acres. This is the density listed in Appendix 2.3-A (Determination of Special, Exceptional, Critical or Unique Lands), p. 2.3-A-9.

3. *SDCL 45-6B-12 and ARSD 74:29:06:01: Please submit approval of the reclamation seed mix and the postmining land uses from Custer and Fall River County.*

Response: Approval letters from Custer and Fall River counties for the reclamation seed mix and postmining land use are provided as replacement pages for Appendix 6.4-A.

4. *SDCL 45-6B-37 and ARSD 74:29:07:04(2): In the grading plan in Section 6.4.3.1 in Volume 1 of the mine permit application, please address how areas outside the affected graded areas will be protected from slides during grading activities.*

Response: Protection of areas outside of the affected graded areas from slides or other damage will be accomplished by avoiding the use of highwalls, contouring disturbed areas to blend in with the natural terrain and not constructing reclaimed slopes steeper than 3:1 unless DENR approves steeper slopes. This information has been added to Section 6.4.3.1. Table 1.1-2 has been updated to reference Section 6.4.3.1 under ARSD 74:29:07:04(2).

5. *SDCL 45-6B-46: Please show on a map the "alkaline area" referred to in the response for this statute.*

Response: Please refer to Figure 3.4-11 for the location of the "alkali area" referred to in the December 3, 2012 comment responses and discussed in Sections 3.4.2.2.3, 6.4.3.2 and 6.4.3.4 of the LSM permit application.

6. *ARSD 74:29:02:11(10 and 13): Please submit a conceptual spill contingency plan that addresses the procedures Powertech will use to report spills of plant reagents, fuel, and other chemicals to all state and federal agencies and the personnel responsible for reporting the spills.*

Response: A conceptual spill contingency plan is provided as Appendix 5.6-C (attached). The conceptual plan describes the general content of the final spill contingency plan, which will be prepared and provided to DENR and NRC prior to operation. The major sections in the conceptual plan include:

- Introduction
- Emergency Contacts
- Site Location and Transportation Routes
- Applicable Permits and Licenses
- Material Inventory

- Spill Prevention Best Management Practices
- Spill Response and Cleanup Procedures
- Reporting and Recordkeeping
- Miscellaneous

Also, please provide conceptual plans and specifications for the land application diversions, berms, and catchment areas.

Response: Conceptual plans for the land application diversions, berms and catchment areas are found in Attachment D of the December 3, 2012 completeness comment responses. Specifically, Plates 5.4-1 and 5.4-2 depict the conceptual designs for the Dewey and Burdock land application systems, respectively. These were included with the July 3, 2012 technical comment responses for the groundwater discharge plan application (PDF pages 124-125 in Attachment D). The July 2012 comment response letter and replacement pages describe the conceptual catchment area operating plan.

The earthwork specifications contained in Appendix 5.3-B of the LSM permit application will be used to construct all diversions, berms, and catchment areas. Specifically, Sections 4 through 8 in Appendix 5.3-B provide specifications for surveying, topsoil stripping, excavation, fill selection and placement, compaction, QA/QC methods, and as-built plan development. The compaction requirements are contained in Table 3.1 of Appendix 5.3-B and include compacting fill to at least 92% of the maximum dry density and to within ± 3% of the optimum moisture content.

7. *ARSD 74:29:05:16(2), (3), and(8):* *Under site geology and surface and ground water, please address the potential for land applied water to flow through the alluvium and into Beaver and Pass Creeks as shown in Plates 3.2-3 and 3.2-25. Also, under adjacent land use, please address effects from land application solution on cropland in and around the land application area.*

Response: Section 5.4.1.1.2 has been updated to address the potential for land applied water to flow through the alluvium and into Beaver or Pass Creek, and the potential impacts to nearby cropland. Following is a summary of the information added to Section 5.4.1.1.2.

Potential for Land Applied Water to Reach Beaver Creek or Pass Creek

Land applied water has a very low potential to flow through the alluvium and reach Beaver Creek or Pass Creek based on geologic conditions, Powertech's commitment to plug and abandon existing wells within the land application areas, operating plans, and the implementation of extensive monitoring systems. Each of these is described below.

Geologic Conditions

Geologic conditions make it unlikely that land applied water will reach alluvial groundwater. These conditions include the limited presence of alluvium in the Dewey land application area and the thickness and composition of the material beneath the land application areas. In the

Dewey area, most of the planned primary pivot areas do not overlie alluvium. Of the 315 acres of primary center pivots planned in the Dewey area, only about 55 acres (17 percent) occur within the extents of mapped alluvium (refer to Figure 6.1-1 in the GDP application). While most of the planned Dewey standby pivot areas overlie mapped alluvium, the potential for land applied water to reach the alluvium in the standby areas is much lower, since Powertech does not anticipate using these areas regularly.

In all potential land application areas (Dewey and Burdock), the thickness and composition of the material between the pivot areas and alluvial groundwater, where present, will act to prevent land applied water from reaching alluvial groundwater. In the Burdock area, the depth to the top of the alluvial gravel within the planned pivot areas ranges from about 12 to 35 feet and is typically 15 to 25 feet. The depth to alluvial groundwater, where present, is typically 13 to 35 feet. In the Dewey area, there are only limited areas in which the planned pivot areas overlie saturated alluvium. Based on ambient sampling conducted in support of the GDP application, the depth to alluvial groundwater, where present beneath the potential Dewey pivot areas, is anticipated to be at least 18 feet. By comparison, the SPAW model simulations predict that the land application water will not percolate deeper than 8 feet.

The soil hydraulic properties beneath the land application areas will help prevent the migration of water into the alluvial groundwater. Soils sampled from test pits in and around the land application areas predominantly contain clay and silt, with lesser amounts of sand and virtually no gravel to depths of 7 to 10 feet. The SPAW modeling simulations considered permeability measurements from soil samples collected in the land application areas.

Plugging and Abandoning Existing Wells

Powertech has not identified any existing wells within the proposed Dewey land application area. Within the proposed Burdock land application area, there are two existing wells, including one former domestic well (well 43) and one stock well (well 15). Prior to operation of the Burdock land application system, both of these wells will be plugged and abandoned with bentonite or cement grout in accordance with the procedures in ARSD 74:02:04:67. This will eliminate the potential for vertical migration of land applied solutions through existing wells.

Operating Plans

The land application rate has been designed specifically to minimize percolation below the rooting zone. The typical application rate is about 19 inches during the land application season of approximately April through October. This is a typical agronomic rate for growing alfalfa and grasses in this region.

Monitoring Systems

Groundwater monitoring will allow Powertech to track the movement of land applied water through the subsoil beneath the land application areas, determine whether land applied water reaches the alluvium, and track changes in alluvial water quality within the POP zones to prevent migration of land applied water outside of the POP zones or into Beaver Creek or Pass Creek.

Monitoring systems will include suction lysimeters installed beneath each land application and catchment area to track the movement of water through the subsoil, interior wells to track changes in alluvial water quality within the POP zones, and compliance wells established at the downgradient edges of the POP zones. Monitoring results from suction lysimeters and interior wells will provide early detection of potential migration of land applied water into and through the alluvium. Early detection of potential impacts will allow Powertech to adjust the operating parameters, such as the rate of application to various pivots, to avoid potential impacts to alluvial groundwater outside of the POP zone and to avoid potential impacts to Beaver Creek or Pass Creek.

The alluvial groundwater monitoring program associated with the GDP also will detect any potential impacts to Cheyenne River alluvium. The mapped Beaver Creek and Pass Creek alluvium are contiguous with the Cheyenne River alluvium, and the position of the interior and compliance monitor wells will ensure that any land applied water entering Beaver Creek or Pass Creek alluvium will be detected. There is no pathway for land applied water to eventually reach the Cheyenne River alluvium without first passing a compliance well. Further, Powertech will monitor other alluvial wells farther downgradient in the Beaver Creek and Pass Creek alluvium (e.g., wells 677 and 678). Periodic monitoring of these downgradient alluvial wells will allow detection of any potential impacts from the land applied water on Beaver Creek, Pass Creek, or Cheyenne River alluvium.

If the results of monitoring show that groundwater outside of the POP zone or surface water in Beaver Creek or Pass Creek have potential to be impacted, Powertech will initiate a corrective action plan as described in the GDP application. Potential corrective actions include adjusting operating parameters and/or initiating a pump back or pump and treat system to recover alluvial groundwater.

Potential Impacts to Nearby Cropland

The land application systems have been sited and will be operated to avoid any potential impacts to nearby cropland. No cropland is within or immediately adjacent to the proposed land application areas, and the land application systems will be operated to avoid overspray as a condition of the GDP. As described above, potential impacts to alluvial groundwater will be limited by geologic conditions, plugging existing wells, applying water at an agronomic rate, and extensive monitoring. This in turn will prevent potential impacts to adjacent cropland via groundwater pathways.

8. *ARSD 74:29:07:07(2, 3, and 5): Please clarify the topsoil estimates in the December 4 submittal. We used the estimated topsoil salvage depths and acreages in the December 4 submittal and calculated topsoil salvage amounts of 77,440 to 174,240 cy for the Burdock process and pond area and 38,720 to 103,253 cy for the Dewey process and pond area. These volumes are different than those Powertech mentions in the December 4 submittal.*

Response: The topsoil volumes reported in the response to comment #25 in the December 2012 submittal were rounded to the nearest 50,000 cubic yards. The values were rounded to account for the uncertainty in the volume estimates, which were based on approximate topsoil stripping limits and topsoil salvage depths obtained from the baseline soil survey. Prior to stripping, the precise topsoil stripping limits will be delineated based on construction-level designs, and the salvage depths will be determined based on additional testing. The estimated topsoil stockpile volumes generally were rounded up to account for uncertainty in the estimates and to provide conservatively large topsoil stockpile footprints. Section 5.3.7 has been updated to indicate that the topsoil stockpile volume estimates are approximate.

> *Also, the department wants Powertech to address whether the topsoil to be salvaged and used in reclamation will need fertilizer or other amendments to establish a vegetative cover on reclaimed areas. This does not include the "alkaline" area or the Darrow Mine area. The department is concerned that the poor vegetation noted on drill sites under Powertech's exploration permit, which were located in portions of the proposed affected area, may be attributed to lack of soil nutrients.*

Response: In the processing areas and the first well field in each of the Dewey and Burdock areas, Powertech will analyze the topsoil prior to stripping to determine whether fertilizer or other amendments will be required to establish and sustain vegetative growth during reclamation. Prior to sampling, Powertech will submit a sampling and analysis plan that includes sampling density and parameters to DENR for review and verification. The sampling results and evaluation of whether adequate nutrients are available and whether fertilizer or other amendments will be required to establish and sustain vegetative growth will be submitted to DENR for review and verification prior to topsoil stripping. The need for topsoil sampling in the subsequent well fields will be coordinated with DENR based on the results of the initial sampling and the success of interim revegetation in the initial Dewey and Burdock well fields. Sections 5.3.7 and 6.4.3.2 have been revised to include these commitments.

> *In addition, please address whether Powertech plans to temporarily distribute a portion of the topsoil. If so, please address section 2 of this regulation.*

Response: As described in Section 6.4.3.2, Powertech plans to temporarily distribute topsoil over areas of interim reclamation. These areas include well fields, pipelines, and buried power lines. In these areas, topsoil will be stripped and stockpiled temporarily while the facilities are constructed. The topsoil will be replaced at an approximately 1:1 ratio in the area from which it was stripped when the construction in the area is complete. Following topsoil replacement, interim revegetation will be performed to control erosion as described in Section 6.4.2. Section 6.4.3.2 has been revised to specifically address the requirements of ARSD 74:29:07:07(2), including:

- Revegetating areas of interim reclamation using the same seed mixture as the final seeding mix to ensure that the topsoil or subsoil capacity and productive capabilities are not diminished by the distribution and can be restored [part (a)]

- Revegetating areas of interim reclamation and using erosion control BMPs as necessary to ensure that the topsoil is protected from erosion [part (b)]
- Replacing topsoil in a 1:1 ratio in the area from which it was stripped to ensure that sufficient topsoil will be available for final reclamation [part (c)]

Finally, on page 1-14a in Table 1.1-2, please change ARSD 74:29:07:06(3) to 74:29:07:07(3).

Response: The typographical error in Table 1.1-2 has been corrected.

9. *ARSD 74:29:07:08(2): Section 3.5.4.1.1 referred to in Table 1.1-2 for this regulation does not address compliance with South Dakota surface water quality standards for surface water sites and ground water quality standards in the land application area during and after the mining operation and during reclamation. Please address compliance with these standards both during and after the mining operation and during reclamation.*

Response: Section 5.6.4.2 has been updated to address compliance with South Dakota surface water quality standards for surface water sites during and after ISR operations and during reclamation. It includes information from the December 2012 response to completeness comment #26, including mitigation measures to ensure that the Dewey-Burdock Project does not cause significant changes in surface water quality and routine monitoring to demonstrate compliance with the antidegradation policy for surface waters in ARSD 74:51:01:34. The monitoring and mitigation measures will be implemented during and after ISR operations and during reclamation.

Section 5.6.3.2 has been updated to address compliance with groundwater quality standards in the land application areas during and after ISR operations and during reclamation. It includes the information from the December 2012 response to completeness comment #26, including describing the mitigation measures and monitoring systems that will be required as part of the GDP.

10. *ARSD 74:29:07:09(6): Although some of the ponds in the two process areas hold only treated water, they are considered part of the process area. Therefore, the diversions for these ponds should also be designed for the 6-hour PMP event.*

Response: As discussed during a December 19, 2012 conference call, the diversions around the treated water storage ponds and spare storage pond were not designed for the 6-hour PMP event, since a) these ponds will store only treated water en route to land application that will not contain radionuclides in excess of allowable discharge limits, b) the treated water storage ponds are not associated with uranium processing or wastewater treatment, and c) NRC regulatory guidance indicates that diversion designs for isolated areas where pond failure would neither jeopardize human life nor create damage to property or the environment beyond Powertech's financial assurance capabilities do not need to use extremely conservative flood design criteria. During the

conference call DENR indicated that the primary concern with the treated water storage ponds and spare storage ponds is that they could be used to store untreated water in the future. To address this concern, a commitment has been added to Section 5.3.9.1 that Powertech will not change the use of the treated water storage ponds or spare storage ponds without applying for an LSM permit amendment, the application for which would include diversion designs for the 6-hour PMP event. In addition, Powertech commits to providing diversion designs for the treated water storage ponds and spare storage ponds during the technical review period. These diversions will be capable of passing the 2-year, 6-hour event without erosion and have the capacity for a 100-year, 24-hour event.

11. *ARSD 74:29:07:12(6): In the December 4 response, Powertech states it wants to continue using the existing low water crossing in Pass Creek within the cottonwood galley riparian zone instead of constructing a culvert or bridge at the crossing. Since the road in this area will be upgraded to a secondary road to transport personnel and equipment, and since Pass Creek is a prominent drainage in this area, Powertech is required to install a culvert or bridge at this crossing. Please submit conceptual designs for the culvert or bridge crossing and address subsection 6 of this regulation.*

Response: The previously shown secondary access road across Pass Creek in the NWNW Section 3, T7S, R1E will no longer be upgraded to a secondary road, but will be designated as an unimproved, tertiary road. The primary access route to the potential wellfield in the SW Section 34, T6S, R1E (B-WF10) will use existing roads on the west side of Pass Creek that will be upgraded to secondary access roads. Plate 5.3-5 (Sheet 2) has been updated to reflect these changes. In addition, Plate 5.3-5 (Sheet 1) has been updated with the revised culvert table reflecting that two culverts (#22 and #23) are no longer required.

Also, we did not receive revised Plate 5.3-5 that is mentioned in the December 4 response letter. Please submit the revised plate that shows the location of the culvert crossing over Pass Creek.

Response: Plate 5.3-5 (Sheets 1 and 2) have been included in this comment response package as requested.

12. *ARSD 74:29:07:21(1): Please clarify if Powertech plans to document targeted alfalfa production potential based on pre-mining data, a reference area, or alfalfa production in nearby surrounding areas. Powertech should provide data from pre-mining areas or current alfalfa production in the surrounding area if those options are chosen. If Powertech plans to use reference area data, please address how the data will be collected and used to compare to alfalfa production in the reclaimed areas.*

Response: Powertech plans to compare alfalfa production in reclaimed cropland with that in undisturbed areas within or adjacent to the permit area. The permit area contains hundreds of acres of cropland, of which up to 2 acres are projected to be disturbed. The remaining undisturbed cropland will provide an adequate basis for comparison. To address current alfalfa

production in the surrounding area, a commitment to document alfalfa production in undisturbed areas within the permit area has been added to Section 6.4.1.2. According to the landowner who grows alfalfa within the proposed permit area, the average annual alfalfa production over the past 10 years is 1.75 tons per acre (personal communication between John Putnam and Lisa Scheinost, Powertech, January 4, 2013). Powertech will provide annual crop yields within the permit area beginning in 2013, with updates each year prior to and during ISR operations and during reclamation.

Technical Comments

As discussed during a December 19, 2012 conference call, Powertech will provide responses to the technical comments during the technical review period for the LSM permit application, following the determination of procedural completeness.

Thank you for the prompt completeness review. Please direct any questions regarding these comment responses to Richard Blubaugh at (303) 790-7528 or Jack Fritz at (307) 672-0761.

Sincerely,

Jack W. Fritz

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Encl: Attachment 1 Documentation of Transfer of Mining Leases to Neutron Energy, Inc.
Change index
Replacement pages

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