



# Public Service Commission

## State of North Dakota

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### COMMISSIONERS

Brian P. Kalk  
Kevin Cramer  
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Executive Secretary  
Darrell Nitschke

600 East Boulevard, Dept. 408  
Bismarck, North Dakota 58505-0480  
Web: [www.psc.nd.gov](http://www.psc.nd.gov)  
E-mail: [ndpsc@nd.gov](mailto:ndpsc@nd.gov)  
Phone: 701-328-2400  
ND Toll Free: 1-877-245-6685  
Fax: 701-328-2410  
TDD: 800-366-6888 or 711

July 9, 2012

Richard A. Southwick  
Great Northern Project Development L. P.  
Vice President - Environmental  
173 Cottonwood Road  
Townsend, MT 59644

Re: South Heart Coal LLC

Dear Mr. Southwick:

The Reclamation Division has reviewed South Heart Coal LLC's March 30, 2012 response to our technical review letter and related changes to the application for Surface Mining Permit No. SHSH-1001 for the proposed South Heart Mine. The following items must be adequately addressed before the informal conference will be reconvened.

### **Section 1 – Introductory, Legal, Financial, Compliance, and Related Information**

#### **Subsection 1.3.3 – Name of Officers, Directors, Share Holders and Organizational Structure of SHC**

1. Original item No. 22: Figure 1.3-1 was revised and it implies that GNPD, Inc. is a 1% owner of Great Northern Project Development, L.P. However, Table 1.3-1C indicates that GNPD, Inc. is a 1% Shareholder of Great Northern Project Development, L.P. Please clarify GNPD, Inc.'s relationship to Great Northern Project Development, L.P and account for the remaining 99% ownership. (DKM)

#### **Subsection 1.3.5 - Permit Area Surface and Coal Interests**

2. It appears that the North Dakota Century Code citation for NDCC 38-14-06 in the first paragraph of Subsection 1.3.5 on page 5 should be corrected to cite NDCC 38-18-06 instead (the Surface Owner Protection Act). To improve clarity we suggest that the sentence be rearranged so that NDCC 38-18-05 and 38-18-06 are cited consecutively. (WTG)
3. Follow-up to Item No. 13: Although oil and gas lease information has been added to the permit via links to detailed title reports in Appendix 1.3-2 Coal Ownership as requested, we believe that minor narrative revision is necessary that will clearly direct the reader to the information.

Please use your discretion, but we suggest the following revision to the first sentence of the second paragraph of Subsection 1.3.5 on page 5 to provide the necessary clarity: “A detailed title report for each tract accessible via links in the Title ID columns of Appendices 1.3-1 and 1.3-2 includes ...” Also, headings on Appendices 1.3-1 and 1.3-2 should indicate these sections contain surface and subsurface leasehold information as well as the surface and coal ownership information. (JRD, WTG)

4. Please update the second paragraph of Subsection 1.3.5 on page 5 to describe the June 7, 2012 decision by the North Dakota Supreme Court that upheld the zoning permit issued by the Stark County Board of County Commissioners. (WTG, BEB)
5. Please label Section 20 on Figure 1.3-2, Surface Ownership, and Figure 1.3-3, Coal Ownership. (WTG)

#### **Appendix 1.3-1 – Surface Ownership**

6. For Title IDs S-1399808-A and S-1399818-A (the William & Darlene Zarak Family Trust land in Sections 8 and 18, respectively) please provide an address for the trustees (currently just listed as South Heart, ND 58655). Please note rural residents have a physical/911 address and usually a PO Box if they retrieve mail at the Post Office. (ZAT)

#### **Appendix 1.3.2 - Coal Ownership**

7. Please review and correct as necessary the inconsistencies between the “Percent of Parcel Not Leased” column in Appendix 1.3-2 Coal Ownership and the coal lease status (percentage unleased inferred by subtraction) in the corresponding title reports for the following tracts: C-1399815-A (10% versus 20%), C-1399815-B (10% versus 20%), C-1399816-A (55% versus 100%), C-1399822-A (10% versus 20%), C-1399822-B (about 4% versus about 2%), and C-1399822-C (about 4% versus about 2%). (WTG, ZAT)
8. It appears that the last entry for Tract C-1399822-B on page 5 of Appendix 1.3-2 Coal Ownership should read “conveyed to Yoder, Linda L.” rather than a repeat of “conveyed to Price, Michael R.” from the row above. Please review and revise as necessary. (WTG)
9. Please review and correct as necessary the coal lease status on the titles for Tract C-1399820-A and Tract C-1399809-H. Both list the Coal Lease Status as 100% leased by South Heart Coal LLC, but neither tract has a lease agreement. (ZAT)
10. Please correct the spelling of Ana to Anna Meyers on the title pages for Tract C-1399815-A and Tract C-1399822-A. (ZAT)
11. On the title page for Tract C-1399822-A, please add Section 23 in line two for clarification (currently only Section 22 is listed) and add the following: Township: 139N Range: 98W Section(s): 22, 23. (ZAT)
12. Please provide the complete address for Great Northern Properties Limited Partnership on the title page for Tract C-1399829-A. (ZAT)

13. The listing of coal owners for Tract C-1399810-F on the title page appears to be missing Mary E. Nordsvan and coal ownership only totals to 98.5%. The table listing of coal owners in Appendix 1.3-2 lists her as a coal owner for this tract. Please review and update as necessary. (ZAT)
14. Please provide the legal description for tract C-1399835-B on page 12 of Appendix 1.3-2. (ZAT)
15. Numerous tracts in Appendix 1.3-2 list the Gerard M. Perdaems Mineral Trust with Gerard M. Perdaems and Mildred F. Perdaems, Trustees. The Coal Lease and Surface Use Agreement, Pooling Agreement and the signature pages all have Gerald M. Perdaems and Mildred F. Perdaems, Trustees of the Gerald M. Perdaems Mineral Trust typed in, but his signature appears to be Gerard. Please review and correct as necessary or provide an explanation of these discrepancies. (ZAT)
16. Follow-up to Original Deficiency No. 11: The response to the original deficiency indicates that certified copies of the appropriate leases have been provided. However, after reviewing Appendix 1.3-3 and the associated leases, it appears that only the "Memorandum Giving Notice of a Coal Lease and Surface Use Agreement" dated October 7, 2003 is a certified copy. It appears the remainder of the surface and coal leases are not certified by the Stark County Recorder. Each lease must be certified for the reasons discussed in the original deficiency. Please provide certified copies of the remaining lease documents. (JRD)
17. Follow-up to Original Deficiency No. 20: A statement should be added to the last paragraph of Section 1.5.5 stating that SHC will not disturb an area within 100 feet of the outside right-of-way of any public road before the Public Service Commission approval is obtained. (JRD)

## **Section 2 – Environmental Resource Information**

### **Section 2.1 – Cultural and Historic Resources**

18. Original item No. 53: The response to this item indicates that Figure 3.1-1 (Pit Layout and Facilities Map) was updated and the locations of the potentially eligible cultural resource sites are depicted on Figure 3.1-1 with a 100' buffer zone. However, the symbol for potentially eligible cultural resource sites is not depicted on the legend of Figure 3.1-1 nor are the individual sites labeled on the map so the reader does not know the significance of the red dot that was placed on the map. The map must clearly depict these areas as a no-disturbance area. Please identify the potentially eligible cultural resource sites on the map legend and label the individual sites on the map. Each of the 3 potentially eligible sites is located very close to some sort of disturbance (stockpiles and/or ponds). Please be reminded that extreme care will need to be taken to avoid disturbance within 100' of these sites when conducting mining related activities in these areas. (DKM)

### **Section 2.3 – Geology**

19. Follow-up to Original Deficiency No. 71: Revised narrative in Section 2.3.2.6 describes two recent oil and gas permit applications within the Study Area; Perdaems 15-22H and South Hart 17-41H, and the locations of those proposed well sites are depicted on Figure 2.3-16. However, the drilling location proposed in the NW1/4 of Section 17 that is depicted on Figure 2.3-16

labels the well as Perdaems 17-1H, not the South Heart 17-41H well that was described in the narrative. Please review the narrative, map and reference source to correct this apparent discrepancy. (BEB)

20. Follow-up to Item No. 73: Please supplement Table 2.3-12, Suite Two Results: Whole Rock Acid Digestion for Metals, by providing the complete suite (18 metals) of measured parameters generated by whole rock acid digestion for the gamma ray spike depth intervals listed in Table 1 (Murphy 2011a), a copy of which you had previously received. Of the 14 ground water monitoring well boreholes and overburden drillholes with a combined 23 zones of elevated spikes on the gamma ray log, it appears that whole rock acid digestion analysis data for the specific depth intervals listed with increased values or spikes on the gamma ray log has only been provided for overburden drillhole SHOB-41, coincident with the highest recorded uranium value determined through whole rock analysis (10 mg/kg) of the 148 sampling intervals analyzed. Please supplement Table 2.3-12 with whole rock analyses data for the remaining 13 drillholes incorporating the remaining 20 elevated gamma ray spike depth intervals, assuming the data are available. (BEB)

#### **Section 2.4 - Soil Resources**

21. Follow up to Item No. 108: Please fix/enable the hyperlink to Appendix 2.10-1 in the last sentence of the last paragraph in Section 2.4.5.6. (ZAT)
22. Please re-label the hyperlink to the Pre-Mining Wetland Report in Subsection 2.4.4.7 Soil Mapping to remove what appears to be a portion of the path name. (WTG)
23. Please review and correct as necessary the numerical values for slope, lift 1 thickness, and lift 2 thickness columns in Table 2.4-4 Soil Map Unit Descriptions that appear to have been inadvertently rearranged with the March 2012 technical response. For many map units in the table these values are nonsensical; e.g., an average slope of 26 percent and an average lift 2 thickness of 4 inches for Arnegard clay loam (B slopes) or an average lift 1 thickness of 51 inches for Lallie silty clay (A slopes). With your response, please identify all of the values that are corrected in Table 2.4-4. (WTG)

#### **Section 2.5 – Ground Water Hydrology**

24. Please correct the typographical error of hydraulic conductivity conversion on page 16 of Appendix 2.5-9. The last paragraph describes small river drains in the Ground Water Modeling narrative under Section 3.3.2.2 and the metric hydraulic conductivity value of  $1 \times 10^{-5}$  cm/s depicts a U.S. standard conversion equivalent of 0.28 ft/d. It appears the correct conversion value should be .028 ft/d. Please review and revise as necessary. (BEB)

#### **Section 2.6 – Surface Water Information**

25. Follow-up to Item No. 158: In Section 2.6.4.3 - Study Area Surface Water Quality, the upper range for specific conductance (SC) provided for the Heart River on page 19 appears to be erroneous. The water quality results provided in Appendix 2.6-4 indicates the upper range for lab conductivity to be 7416  $\mu$ mhos/cm rather than 2416  $\mu$ mhos/cm as presented in the narrative. (RLK)

26. Please review the first sentence of revised Section 2.6.5.1 – Effects of Mining and Reclamation on Flooding and Stream Flow Alteration and Sediment Yields. It may be helpful to the reader to indicate that the sediment ponds being discussed in the paragraph/section are the controls used during mining and reclamation operations. (RLK)
27. Follow up to Original Deficiency No. 166: The bridge is now labeled as SHB-23 in Table 2.6-3 and as B-23 on Figure 2.6-5. It appears both labels were changed. Please correct this discrepancy. (MSK)
28. Please review the baseline and after reclamation flow information presented in Table 2.6-18 – Comparison of Potential Changes in Flows Following Mine Reclamation. The decrease in flows between the “baseline” and “after reclamation” conditions depicted for the South Tributary of South Branch Heart River seem remarkable considering the small percentage of permit area within the watershed. It appears that approximately 300 to 350 acres of the South Tributary watershed is within the permit area or approximately 3.5% of the entire watershed area but the runoff volumes and peak flows for the South Tributary are projected to be reduced substantially (i.e., 14.7% for the 10-yr 24-hr Runoff Volume and 23.2% for the 2-yr 24-hr Peak Discharge). The narrative in Section 2.6.5.1 indicates that slightly lower flows are anticipated following reclamation within the permit area as a result of improved cover. The change in CN number for land within the permit area would not seem to explain the amount of change demonstrated in the table for the entire South Tributary watershed. Please review and revise or provide additional explanation in the narrative for the anticipated change in flows for the South Tributary in accordance with NDAC 69-05.2-08-04(4). (RLK)
29. Please revise the control point description listed as “South Tributary of South Branch of South Heart” to “South Tributary of South Branch Heart River” in Table 2.6-17 – Comparison of Potential Changes in Flows from Proposed Mine Operations and Table 2.6-18 – Comparison of Potential Changes in Flows Following Mine Reclamation to be consistent with the narrative. (RLK)
30. In Section 2.6.4.2 – Established Water Quality Impairments, please indicate that a Total Maximum Daily Loads (TMDLs) have been developed for the Heart River and the South Branch of the Heart River in the narrative on water quality impairments or the description of the TMDL process. The narrative cites the TMDL document (Nutrient & Sediment TMDL Development for Patterson Lake, North Dakota) several times without identifying that the document establishes TMDL criteria for Patterson Lake as well as the Heart River and South Branch of the Heart River. The established TMDLs are important considerations in responding to the water quality impairments described in the application. The TMDL document outlines the water quality goals to restore uses on the water bodies and is the reason the water bodies no longer appear on the state’s 303(d) list. (KME, RLK)

#### **Section 2.7.1 – Pre-mining Land Use**

31. Please correct the NDAC cites in sentences one and three of the second paragraph on page 6, Section 2.7.1.4. NDAC 69-045.2-01-02 should be NDAC 69-05.2-01-02. Also, the NDAC 69-05.2-23 cite is correct in sentence one, but is incorrect (incomplete) in sentence three. (ZAT)

32. Follow up to Item No. 175: The tract number for the NE ¼ NE ¼ of Section 29 should be Tract S-1399829-A instead of Tract S-1399828-A in paragraph two of Section 2.7.1.5.2. Also, please add the Tract number (Tract S-1399833-A) to the legal description of Field KL3 at the bottom of this page. (ZAT)

#### **Section 2.7.1 – Tables**

33. Table 2.7.1-7 indicates that cropland CRP contracts will be expiring in 2010 and 2011. Please revise the Conservation Use narrative in Section 2.7.1.5.2 to clarify if any of this land was re-enrolled or is being managed as something other than cropland. In addition, Table 2.7.1-7 should be updated as necessary. (GAW)

#### **Section 2.7.1 – Appendices**

34. On Appendix 2.7.1-2 page one; please correct the land description under Ms. Delores Beaudoin – Leocadia Emmil Family Trust. The correct description is N1/2 of Section 34 (currently listed as the N¼ of Section 32). (ZAT)
35. On Appendix 2.7.1-2 page four, please correct the tract number in the second to last paragraph for Cornelius Kooren/Glen Wagner. The tract number should be Tract S-1399829-A. Also on page 5, third paragraph, sentence two should read, “Hunting access is also allowed on the balance of the NE ¼ Section 29. Please correct the typographical error. (ZAT)
36. On Appendix 2.7.1-2 page 7, please correct the land and tract descriptions for James Perdaems in the first paragraph. The narrative should clearly state the correct legal description with tract number. For example, “The property investigated includes the SW ¼ of Section 14 (Tract S-1399814-C), the SE ¼ of Section 14 (Tract S-1399814-A), and the N ½ of Section 22 and Section 23 (Tract A-1399822-A). The S½ of Section 22 owned by Jerry and Sandra Perdaems was also discussed during the interview. (Tract S-1399822-B and Tract S-1399822-C)” (ZAT)
37. On Appendix 2.7.1-2 page 9, please correct the typographical error in sentence one “iszowned” under James Perdaems operator – Peters, Mary Louise et. al. landowners. (ZAT)

#### **Section 2.7.2 – Pre-mining Vegetation**

38. The bookmark labels for Exhibits 2.7.2-1A, 2.7.2-1B and 2.7.2-1C are incorrectly labeled Exhibits 7.7.2-1A, B & C. Please correct this error. (GAW)

#### **Section 2.9 – Fish and Wildlife Resources**

39. A sentence in the middle of page 42 of Section 2.9.2.2, Protection of Fish and Wildlife Resources, states that “topsoil and subsoil will be directly hauled and placed on regarded” areas. It appears that the word “regarded” should be “regraded”. Please make the appropriate changes. (GAW)
40. A sentence in the second paragraph of Section 2.9.1.4 states that the Study Area supported good fish and wildlife species richness; however, earlier in this section the fisheries value was

claimed to be low or limited base upon other studies. Please review and revise this sentence to clarify if the fish species richness was “good” as indicated. (KME)

41. Follow-up to Item No. 206: Please revise Section 2.9.3.1 to state that the SHLM will develop a fish and macro-invertebrate monitoring plan for South Branch of the Heart River, in consultation with the ND Game and Fish Department. The plan should specifically state that proper techniques will be used to determine if the northern redbelly dace or sturgeon chub is present. (KME, GAW)

### **Section 2.10 – Wetlands**

42. A sentence in the last paragraph on page 2 of Section 2.10 states that reclaimed wetland basins will be ripped to alleviated compaction and promote root penetration. Generally there is no need to alleviate compaction on wetland basins as the goal is have the basin hold water and in some instances, the basins need to be compacted to reduce infiltration. Please discuss measures that will be taken to ensure that the reclaimed wetland basin will hold water. (GAW)
43. The first sentence of the second paragraph on page 21 of Appendix 2.10-1 states that semi-permanently flooded wetlands correspond mostly with Stewart and Kantrud Class III wetlands. It appears that this should read Class IV wetlands rather than Class III. Please review and correct as necessary. (GAW)

### **Section 3.0 Operation Plans**

44. General – The mining schedule as described in Section 3, and elsewhere, appears unrealistic in that a mining rate of 2.4 to 2.5 million tons per year is proposed beginning in 2016 but plans for a power plant are still under development. We also understand your air quality permit application currently states 150,000 tons of lignite will be mined per year. Please show a more realistic mining schedule in the permit application. (JRD, DKM)
45. Please revise the Navigation Pane Table of Contents and the Operation Plans narrative Table of Contents as well to correctly reference Figure 3.1-5f as Subsoil Removal Areas (Lift 2). As currently presented the figure is referenced as “*Topsoil Removal Areas (Lift 2)*”. (WTG, RLK)
46. Follow-up to Item No. 79: Based on available permit information and other referenced sources including (Murphy 2011a), economic deposits of uranium do not appear to be located within the proposed permit area. However, baseline data provided in the application also indicate that isolated, elevated values or spikes on the gamma ray log were recorded on a handful of geophysical logs generated from within, and peripheral to the proposed permit area. Please provide a scientific assessment of these levels of radioactivity and determine if they pose a threat to human health and/or the environment. Murphy’s review concludes, and we concur, that routine monitoring of dust generated during the mining process for the presence of radioactivity be conducted until such time as it is determined that no environmental impacts and/or off-site impacts are being detected. In addition to the scientific assessment, please outline South Heart Coal’s proposed monitoring plan for the presence of uranium in earth materials to be disturbed and proposed plan for monitoring of fugitive/airborne emissions during mining and reclamation operations. NDCC 38-14.1-24(12); NDAC 69-05.2-13-07; NDAC 69-05.2-16-11; NDAC 69-05.2-16-13 & NDAC 69-05.2-21-03. (BEB)

47. Follow-up to Item No. 203: We recommend that the primary haulroad in Sections 22 and 27 and Ponds No. 2 and 9 be moved away from the floodplain associated with the South Branch Heart River to minimize disturbance to the deciduous woodland community associated with the South Branch of the Heart River. The Reclamation Division believes that this haulroad should be placed west of the initial pits associated with Pit 1, and then be later rebuilt on reclaimed land to minimize disturbance to important fish and wildlife habitat as required by NDAC 69-05.2-09-17(1) and NDAC 69-05.2-13-08(6). Sedimentation ponds No. 2 and No. 9 and the diversion located in the northwest corner of Section 27 should be redesigned to minimize disturbance to deciduous woodland. The Pit Layout and Facilities map shows that the deciduous woodland located between Pit 1 and the Diversion in the northwest corner will be stripped of SPGM and there is no apparent reason why this diversion cannot be located closer to the pit in this area. Please revise the mine plan, Section 3.0, and update the Fish and Wildlife Protection and Enhancement Plan, Section 2.9.2.2 to discuss how the mine plan has been designed to minimize disturbance to the deciduous woodland associated with the South Branch of the Heart River. NDAC 69-05.2-13-08 (6) requires the permittee to locate haulroads, sediment ponds, diversions, stockpiles and other structures to avoid or minimize disturbance to important wildlife habitat. (KME, GAW)
48. Follow-up to Item No. 203: Please revise the Pit Layout and Facilities Map, Figure 3.1-1, to show that the South Tributary to the South Branch of the Heart River is not being disturbed beyond the disturbance boundary of Pit 3. The Pit Layout and Facilities Map indicates that this drainage will be stripped of SPGM between Pit 3 and the haulroad to the north, but there is no apparent reason why this entire stretch of the South Tributary needs to be disturbed. Please review and revise for compliance with NDAC 69-05.2-09-17(1) and NDAC 69-05.2-13-08(6). (KME,GAW)

#### **Subsection 3.1.2.3 Soil Handling Narrative**

49. Please add the following two sentences to the end of the last paragraph on page 8 that precedes the four bullet items of subsection 3.1.2.3 Soil Handling Narrative to inform the reader which overburden sample boreholes were used to project the SPGM respread thickness and where to locate the overburden sample laboratory analysis results: *“Figure 3.1-5g also identifies the overburden sample bore holes used to project SPGM replacement thickness. The overburden sample bore hole laboratory analysis used to calculate the projected SPGM replacement thickness is summarized in Appendix 2.3-6.”* (WTG)
50. Follow-up to Item No. 221-o: The revised narrative of the first sentence in the third paragraph on page 10 of subsection 3.1.2.3, Soil Handling Narrative, stating that topsoil and subsoil will be segregated based on land ownership appears to preclude the option of soil mixing agreements. Please revise the sentence as follows to retain the option of soil mixing agreements: *“As topsoil and subsoil material is removed, it will be segregated into stockpiles based on land ownership if no SPGM mixing agreements exist as required by NDAC 69-05.2-15-04(6)”*. Please also explain if Exhibit A (voluntary pooling agreement) of the Coal Lease and Surface Use Agreement linked in Appendix 1.3-3 commits the surface owners in the planned coal removal areas to mix SPGM with the other surface owners. At your discretion, you may wish to expand the narrative to explain the voluntary pooling agreement if it commits the surface owners in the planned coal removal areas to mix SPGM with the other surface owners. Please note that it does not appear that signatories of separate surface leases in areas

not planned for mining are committed to mixing SPGM. Please also correct the minor error of emplacement data for date elsewhere in the paragraph. (DKM, WTG, ZAT)

51. Please revise the paragraph on sampling other suitable strata on page 11 of subsection 3.1.2.3, Soil Handling Narrative, as follows to meet the requirements of NDAC 69-05.2-08-11: “... with a minimum of 1 borehole per 10 acres or on a sampling density determined by the commission will be completed ...” (WTG)
52. Follow up to Original Deficiency No. 221: The last paragraph on page 11 of Section 3.1.2.3, Soils Handling Narrative, states that South Heart Coal will direct respread topsoil on final graded spoils. This is an inaccurate statement as the direct re-spread operation is to be used to respread topsoil on areas respread with subsoil following approved by the PSC. Please reword the paragraph accordingly. (MSK)
53. Follow up to Original Deficiency No. 221: In the last paragraph of Page 13 you indicate that SHC will determine stockpile volumes by load count or topographical survey. While load counts can provide an estimate of SPGM volume, the methodology is not accurate enough to maintain an accurate volume of SPGM inventory. An accurate SPGM inventory can only be maintained by surveying or similar methodology. Please clarify this statement accordingly. (MSK)
54. Follow up to Original Deficiency No. 221-t: There is no statement in the third full paragraph of page 13 in Section 3.1.2.3, Soil Handling Narrative, which addresses stockpile compaction or consolidation and how SHC plans to abate this issue. Please address. (MSK)
55. Follow up to Original No. 221-p: In Section 3.1.2.3, please include the following or similar statement to clarify the water management of the stockpiles. “*Drainage from all soil stockpiles will be directed to sediment ponds or other water management structures, including stockpile berms, except where site-specific approval has been obtained to use alternate best management practices such as silt fences, straw bale dikes, or small sumps.*” (MDB)

#### **Subsection 3.1.2.4 – Operation Plans – Overburden Removal**

56. The first paragraph in Section 3.1.2.4, Overburden Removal states that overburden material will remain stockpiled until it can be respread on a regraded area. Overburden (spoil) material should be used to backfill areas and/or bring graded spoil surfaces to final elevation prior to SPGM respread. Please clarify the statement. (MSK)
57. In the Overburden Removal narrative of Section 3.1.2.4, please describe South Heart Coal’s proposed methodology for accurately locating, field marking, and subsequently safely removing a portion of the surface casing and well abandonment plug to the depth of mining, of the Perdaems #1 dry well located in the SW1/4 of Section 15, which is located in an area proposed for coal removal. Permit information describes this well as being plugged with cement from surface to total depth. (BEB)
58. Follow up to Original No. 226: In Section 3.1.2.4, Page 16 of the narrative was updated to comply with NDAC 69-05.2-15-03 which strictly deals with SPGM not overburden. At the time of our initial technical review of the permit application, there was not a clear distinction between the handling of SPGM, suitable strata, and overburden. However with this recent

submittal, that distinction has been made. Please remove the rule citation as it does not apply to overburden stockpiles, also it does not require overburden fill to be placed in four foot lifts. However, NDCC 38-14.1-24(4) pertains to the stabilization of stockpiled overburden. Also please remove the NDAC 69-05-2-18-01(5) from page 17 as this rule citation deals with excess overburden and it is not applicable to stockpiles which will be reclaimed. (MDB)

#### **Subsection 3.1.2.5 – Operation Plans – Lignite Removal**

59. Section 3.1.2.5, Lignite Removal, states the coal will be hauled the coal crushing facility located at the “mine facilities area”. Later in the same paragraph it states the coal will be transported to the coal crushing facility located at the “Plant Facility” and stockpiled there if it is unable to be accepted. Section 3.1.3.6 states the coal will be crushed and temporarily stored “near the active mining area within the pit” and Section 3.1.3 indicates the crusher and lignite stockpiles will be located at the “mine support facility”. Please correct these discrepancies between the various sections of the permit. Any proposed coal stockpiles and associated facilities should be depicted on the Pit Layout and Facilities Map per NDAC 69-05.2-09-02 (8). (MDB, MSK)

#### **Subsection 3.1.2.8 – Operation Plans – Regrading and Reclamation**

60. Follow up to Item No. 229: Please revise the text added to Section 3.1.2.8 page 19 from “*The topsoil, subsoil or suitable strata will be spread to a required depth per the post mining topographical plan which is approved by the PSC prior to beginning SPGM respread operations as required in NDAC 69-05.2-21-06. The area will then be revegetated as described in Section 4.3*” to the following: “*Prior to respreading of topsoil and subsoil or suitable strata on graded spoil, SHC will submit a Grade Approval request to the Commission per NDAC 69-05.2-21-06. Upon approval of the Grade Approval request, SPGM will be respread to the approved depths and revegetated as described in Section 4.3.*” (MDB, ZAT)

#### **Subsection 3.1.2.9 – Operations Plan – Intermittent and Perennial Stream Buffer Zone**

61. Please revise Section 3.1.2.9 to indicate the status of the USACE 404 wetlands determinations and permitting process, and the results of those determinations (i.e., identify the jurisdictional wetlands). We recommend including a map that identifies the jurisdictional wetlands and waters of the United States based on the Corps determination. (GAW)

#### **Subsection 3.1.3.6 – Operation Plans – Crusher and Lignite Stockpile**

62. Follow up to Original No. 217: The response to this item states “As mining advances in the pit area, the equipment and stockpiles will move accordingly; they are intended to be mobile and be located near the active mining area.” Section 3.1.3.6 states “There will be equipment and stockpiles used for crushing and temporary storage of lignite which will be located near the active mining area within the pit.” Please clarify if the crusher and coal stockpile will be located in the pit or near the active mining area outside of the pit. In addition, please clarify the time frame of the “temporary storage” and if the temporary stockpiles will result in a delay from the contemporaneous reclamation efforts requirement of NDAC 69-05.2-21-01(2). If the crusher and piles are located outside of the pit, their location will need to be shown on the Pit Layout and Facilities Map as required by NDAC 69-05.2-09-02(7)&(8). Please expand the

narrative of Section 3.1.3.6 to provide the necessary details and to maintain consistency with other sections of the permit application. (MDB)

### **Subsection 3.2 – Operation Plans – Existing Structures**

63. Section 3.2.1 – Existing Structures Narrative indicates that there is a 4-inch and 6-inch crude oil pipeline in the proposed permit area; however, neither Figures 3.2-1a, b or c show where this pipeline is located. Please depict the locations of these pipelines on the Existing Structures Map. We recommend incorporating Figures 3.2-1a, 3.2-1b, and 3.2-1c into a single map that depicts all of the existing structures including the crude oil pipelines mentioned in narrative. Please consolidate all three of the aforementioned figures into one comprehensive figure and locating the crude oil pipelines as mentioned in the narrative. Please also consider consolidating the various Utilities Re-Route Maps (Figures 3.1-5a – d) into a single map. (MSK)

### **Subsection 3.5 – Operation Plan – Transportation Facilities**

64. Section 3.5.1.2 states that MHR 1 begins at the “planned coal crushing facility” and heads north; however, as noted in a previous deficiency, there is a discrepancy as to where the coal will actually be crossed and/or stockpiled. If the coal is going to be crushed at the mine facilities or in the active mining area and heading north, then it appears that the south portion of MHR-1 and the associated bridge would not be needed at this time. Please clarify the need for the south portion of the haulroad at this time based on its need. (MDB)
65. The first sentence of Section 3.5.1.2, Haul Road, Access Road and Coal Ramp Plan, states that Segment 1 of the Main Haul Road (MHR) begins at the planned coal crushing facility and heads north following the west side of Pit 3. This road crosses the South Branch of the Heart River and according to Figure 3.5-11B, Right of Way Closure and Road Relocation Map, is to be designed and constructed in 2014. Please include language in the permit stating that the riparian area associated with construction of the South Branch of the Heart River Bridge will not be disturbed until all associated permits have been secured to ensure that the coal crushing facility will indeed be constructed south of the proposed permit area in Section 34 as planned. (GAW)

### **Subsection 3.6 – Operation Plan – Surface Water Management**

66. Please revise additional details in Section 3.6.1, Surface Water Management Plan, to discuss how SHC plans to comply with NDAC69-05.2-16-08 in those instances where only BMP’s will be used to minimize the amount of sediment carried by runoff into the South Branch of the Heart River, specifically in Sections 27, 28, and 34 . (MSK)
67. Follow up to Original No. 256: The narrative as well as Figure 3.6-9 was updated to address the haulroads in general. However, the area where MHR1 crosses the South Branch of the Heart River is of special concern and needs to be addressed independently as it crosses the entire flood plain. Also, please include the remainder of MHR1 on Figure 3.6-9 and show the BMP’s that will be implemented. (MDB)
68. In Section 3.6.5, please update the last sentence on page 52 to incorporate the BMP’s which will be used to control runoff from haulroads as was done in Section 3.6.3. (MDB)

69. In Section 3.6.5, page 54 states “A copy of the quarterly reports will be submitted to the PSC within 30 days of the inspection.” The annual inspection conducted by a PE must be submitted to the Commission within 30 days of the inspection, the quarterly inspections only need to be maintained at the mine site for review. Please revise accordingly. (MDB)

### Section 3.0 – Operation Plans - Tables

70. On Table 3.1-1, Annual Area Disturbed, no disturbed acreage (“25”) is listed for 2013; however, the footnote states that the areas included in 2013 are for infrastructure and facilities development for mine expansion. If construction activities will begin in 2013, please provide the number of acres that will be disturbed in 2013. Also update the footnote to indicate that “acres disturbed from 2014-2045 are attributed to mine operations” to be consistent with table. (MSK)
71. Please revise Table 3.1-5a, SPGM Inventory by Landowner and Land Tract Number - Life of Mine, to limit the projected SPGM surplus or deficit calculations to only those areas within the mining disturbance boundary; i.e., mine pits where SPGM will be respread on graded spoil. As currently presented, the projected SPGM surplus or deficit calculations shown on Table 3.1-5a includes about 646 acres of associated disturbance. The same volume/thickness of SPGM that is removed from associated disturbance areas need to be respread on those areas so it is not appropriate to include the associated disturbance areas in the surplus/deficit calculations. Please limit the entries in Table 3.1-5a to the acreage of landowner tracts (about 2,617) within the proposed mine pits. Please also update the projected subsoil balance where mentioned in subsection 3.1.2.3 - Soil Handling Narrative to reflect the revised calculations. (WTG)
72. As noted in a related deficiency for Figure 3.1-5g SPGM Projected Respread Thickness Map, please review your interpretation of Appendix 2.3-6 Overburden Analysis Data for the following overburden sample bore holes in accordance with NDAC 69-05.2-15-04(4)(a)(2) and Policy Memorandum No. 17 and recalculate the values in columns L, M, N, and O (last four far right hand columns) in Table 3.1-5a SPGM Inventory by Landowner and Land Tract Number - Life of Mine as necessary. (WTG)
- a. It appears that the 24 inch SPGM respread thickness currently projected around overburden sample bore holes 109R, 22R, 112R, 25C, 114R, 26R, 28R, 116R, and 42R should be increased to 36 inch SPGM respread thickness primarily because of coarse textured overburden at the listed locations; and,
  - b. It appears that the 48 inch SPGM respread thickness currently projected around overburden sample bore holes 13R, 06BR, 07R, MW-04D, 16R, 24R, 40R, 41R, 29R, 115R, 120R, 121R, 38R, 133R, and 30C could be decreased to 36 inch SPGM respread thickness because of overburden SAR values that do not require 48 inch SPGM respread thickness at the listed locations.
73. On added Table 3.1-5b, Shallow Overburden Borehole Sample Analysis, it appears that for boring SOSH-43 additional sampled strata below 12 feet could be highlighted in red as material to be considered as other suitable strata based on the chemical and physical properties presented in the table. Please review and revise as appropriate. (RLK)

74. Table 3.5-1b is correctly titled “Culvert Sizing and Plunge Pool Dimensions for Multiple Alternatives”; however, the corresponding bookmark lists this as “Shallow Overburden Borehole Sample Analysis”. Please correct as necessary. (MSK)

### Section 3.0 – Operation Plans - Figures

75. The legend of the Pit Layout and Facilities Map, Figure 3.1-1, indicates that the Mine Pit Boundary is outlined in green and the Pit Blocks are identified with a blue line but green Pit Boundary areas cannot be viewed on this map. In addition, the labels for the ponds, piles, culverts and other features are under the Mine Pit Boundary lines and are not legible in many instances. Please revise so information on the map is clearly depicted. (KME, GAW)
76. Please label each pit in each Pit Areas 1, 2, 3, 4a and 4b on the Pit Layout and Facilities Map, Figure 3.1-1, as required by NDAC 69-05.2-09-02 or provide an arrow that depicts the direction of mining for each sequence. (GAW)
77. The legend of the Pit Layout and Facilities Map, Figure 3.1-1, indicates the topographic contour interval to be 10 feet; however, the contour interval used on the map is 5 feet. Please correct the information in the legend. (BEB)
78. The Operations Narrative states that mining related waste will be disposed of in designated areas within the permit boundary; however, it appears that such areas are not identified on any maps. Please identify any designated waste disposal areas on the appropriate map in accordance with NDAC 69-05.2-08-02-1. If disposal sites have not yet been selected, then please update the narrative accordingly. (MSK)
79. Follow-up to Item No. 230: It appears that a 100 foot buffer zone has been added for several ephemeral stream segments in addition to perennial and intermittent streams on Figure 3.1-1. Section 2.6.1.1, Watershed Descriptions, identifies the Heart River as perennial, the South Branch Heart River as intermittent and the West Tributary and South Tributary as ephemeral drainages. Please revise Figure 3.1-1 to depict buffer zones for only the perennial and intermittent streams in the area and identify the symbol for the buffer on the map legend. In Section 3.1.2-9, please identify and discuss the specific areas where disturbances (identify the type of disturbance) will come within 100’ of the intermittent or perennial stream (e.g., pond embankments and outfalls, haulroad crossings, stockpiles, spoil placement areas, etc.). (DKM, BEB, GAW, RLK)
80. Follow-up to Item No. 233: The response to the original item indicates that most SPGM stockpiles will be placed in areas that will be mined out in the first few years of mining of each mine pit sequence and will then be respread as mining approaches. By the time that mining approaches these stockpile locations, it seems likely that the SPGM ahead of the pits will also be directly respread on areas behind the pit. We question if there will be enough “room” to respread both the stockpiled SPGM and the SPGM that is being removed ahead of the pit. It appears that very few SPGM stockpiles are planned to be located “off-coal” and most are planned to be located in areas that will be mined in the first few years of mining of that pit sequence. Under this scenario, there would be no stockpiled SPGM that is typically needed for reclaiming the final pit of each pit sequence (i.e., there would be no SPGM available for reclamation of the final pit area). Please review the plans for stockpile placement to provide a

plan that ensures that adequate SPGM will be available for reclamation of the final pit areas and that minimizes disturbance and future potential relocation of stockpiles. (DKM)

81. As noted in a deficiency for the Section 3.1.2.3 Soil Handling Narrative, please depict and label the overburden sample bore holes used to project SPGM respread thickness on Figure 3.1-5g SPGM Projected Respread Thickness Map. Please note that the previous version of the figure (Figure 4.1-10a) depicted and labeled the bore hole locations. Please revise the fill pattern if necessary to ensure bore hole label legibility. (WTG)
82. Please depict 48 inch projected SPGM respread thickness throughout Sections 10, 14, and 28 on Figure 3.1-5g SPGM Projected Respread Thickness Map where no overburden sample borings were completed. Alternatively, since the majority of these areas are not going to be disturbed by coal removal or spoil placement activities, they could be depicted as not requiring respread. (WTG)
83. Please review your interpretation of Appendix 2.3-6 Overburden Analysis Data for the following overburden sample bore holes in accordance with NDAC 69-05.2-15-04(4)(a)(2) and Policy Memorandum No. 17 and revise the projected SPGM respread thickness on Figure 3.1-5g SPGM Projected Respread Thickness Map as necessary. Please note that Figure 3.1-5g was overlain on Figure 2.3-17A Overburden Sampling Boreholes and made partially transparent to correlate the overburden sample bore hole with the SPGM respread thickness currently projected around the bore hole location. (WTG)
  - a. It appears that the 24 inch SPGM respread thickness currently projected around overburden sample bore holes 109R, 22R, 112R, 25C, 114R, 26R, 28R, 116R, and 42R should be increased to 36 inch SPGM respread thickness primarily because of coarse textured overburden at the listed locations; and,
  - b. It appears that the 48 inch SPGM respread thickness currently projected around overburden sample bore holes 13R, 06BR, 07R, MW-04D, 16R, 24R, 40R, 41R, 29R, 115R, 120R, 121R, 38R, 133R, and 30C could be decreased to 36 inch SPGM respread thickness because of overburden SAR values that do not require 48 inch SPGM respread thickness at the listed locations.
84. Follow-up to Item No. 235: Figure 3.2-1a, Existing Structures Map – Powerlines, identifies “occupied dwellings farm buildings” in Sections 19 and 20. These structures are not farm dwellings but are a Natural Gas Station and the GTLE coal beneficiation plant. Figures 3.2-1b and 3.2-1 identify the Natural Gas Station but not the GTLE plant. Figure 2.7.1-2A properly identifies these features. Please correct these discrepancies. (GAW)
85. Please revise Figure 3.5-1, General Haul Roads and Coal Ramps Layout, so that the Ramps, Haul Roads and culvert labels are on top of the topographic lines on the map. It is difficult to read the ramp, haulroad and culvert labels on this map. In addition, it is recommended that the 1000’ stationing labels be retained and that tick marks be used at the 250, 500, and 750 intervals to make the map less cluttered. (GAW, MSK)
86. Follow up to Item No. 243: Figure 3.5-2 still does not show a typical cross section for triangle ditches as required by NDAC 69-05.2-09-06(1), it only shows a typical cross section for a trapezoidal ditch. Please update Figure 3.5-2 or remove the triangular ditch specification from Section 3.5.1.1. (MDB)

87. Please expand the drawing or enlarge the scale of Figure 3.5.4, Facility Access Road Profile, to make it more legible. (MSK)
88. Please use a heavier weight line for the Permit Boundary layer on Figure 3.5.11a, Site Access Route Map, to make it more apparent. (MSK)
89. There are two areas depicted in Pit 1 in Figures 3.5.12, Culvert and Bridge Locations, and 3.6-1, Life of Mine Water Management Plan, that are delineated or outlined in two shades of blue; however, it is unclear what these lines or polygons represent. Please identify these areas in the legend or remove from the map. (MSK)
90. Figure 3.6.1, Life of Mine Water Management Plan, and the Pit Layout and Facilities Map, Pit Layout and Facilities Map, show diversion DD1A, which diverts the flow of the West Branch of the Heart River, as nearly intercepting the undisturbed stream channel in the NE $\frac{1}{4}$  of Section 22 but not entering at this location. It would seem logical to have the diversion re-enter the undisturbed portion of the West Branch of the Heart River at this location rather than continue to the east to the NW  $\frac{1}{4}$  of Section 23. Please justify this additional disturbance of having the diversion run into the NW $\frac{1}{4}$  of Section 23 or make the appropriate changes to the maps. NDAC 69-05.2-09-17(1) and NDAC 69-05.2-13-08 (6) (MSK, GAW, KME)
91. Figure 3.6.6a, Pond 1 (Sheet 1), has an area capacity table for both Cells 1 and 2, with an approximate combined capacity of 69.4 ac-ft; however, the Pond 1 Merged Stage Area Capacity Table on the same sheet has a merged capacity of about 65 ac-ft. Please correct the inconsistency. (MSK)
92. Figure 3.6.6b, Pond 1 (Sheet 2), depicts two Cell 1's within the pond. Please correct as necessary. (MSK)
93. Figures 3.6.6a and b, Pond 1 (Sheets 1 and 2), do not clearly identify where the pipe coming from Sump 1 is located. Please depict this pipe location on these maps. (MSK)
94. Figures 3.6.6a and b, Pond 1 (Sheets 1 and 2), do not clearly identify the spillway profile (similar to cross-section C-C') which was included for Pond 2. Please provide the spillway profile. (MSK)
95. Figure 3.6.6b, Pond 1 (Sheet 2), identifies a weir located in the emergency spillway of Cell 1. Weirs generally have not been used in North Dakota due to the inability to remove boards/planks in winter or early spring conditions. The proposed use of a weir in this location appears unrealistic. Please address how the weir boards will be locked in place to prohibit non-mine personal from removing the boards and provide additional details about the operation of the weir. In addition, please provide the appropriate justification of the weir as part of the design for Pond 1. (MSK)
96. Figure 3.6-7, Pond 2, shows a vegetated channel (appears to be an excavated channel) with a 2% grade entering the South Branch of the Heart River. Please explain in the narrative how topsoil will be removed from this channel and provide plans for vegetating the subsoil or otherwise explain how this channel will be stabilized. (MSK)

97. Figure 3.6-8, Facilities Area Sump, has only one cross section of the sump. Another cross section perpendicular to E-E' should be included in this figure. (MSK)

### Section 3.0 – Operation Plans - Appendices

98. Appendix 3.5-1 and Appendix 3.6-1, Certification Letter, indicate Mr. Hitt's North Dakotas PE Registration Number is PE-2445; however, his stamp indicates it is PE-2442 (as does the ND State Board of Registration). Please correct. (MDB, MSK)
99. In Appendix 3.6.2, Surface Water Management SED CAD, the page numbers listed in the Table of Contents do not correspond with the actual page number of the document or as listed in various narrative sections. Please review and correct the page numbers accordingly. (MSK)
100. Appendix 3.6-2, Surface Water Management SED CAD Reports SHLM, indicates on Page 3 that Pond 1 has a design capacity of 64.69 ac-ft and excavated capacity (2503') of 96 ac-ft. However, on page 23 in the Elevation Capacity Discharge Table, at 2503' a capacity of 80.304 ac-ft is listed and, when you add the Sediment Storage (1.98 ac-ft) to this number, the total capacity is 82.284 ac-ft. The excavated capacity should not be larger than the design capacity, since it should be included in the design capacity. Please review and make the necessary corrections. (MSK, MDB)
101. Page 3 of Appendix 3.6-2, Surface Water Management SED CAD Reports SHLM, indicates Pond 1 has required runoff storage of 36.28 ac-ft; however, the next page indicates that the total runoff is 67.67 ac-ft. Please correct this discrepancy. (MSK)
102. Page 4 of Appendix 3.6-2, Surface Water Management SED CAD Reports SHLM, that shows the Pond 1 Algebraic Assessment of Capacity Needs Table lists several "SUM's" in the SWS # column that appear to be nonsensical, specifically in Stru #'s 6, 7, 16, 18 and 20. Also on this same page, the SUM Pond Drainage and the SUM Pit Drainage totals on the bottom don't appear to be accurate. Please review and make the necessary corrections. (MSK)
103. Differences or inconsistencies were noted in Appendix 3.6-2, Surface Water Management SED CAD Reports SHLM, when comparing the totals listed on Page 4-Pond 1 Algebraic Assessment of Capacity Needs Table (440.49 acres) with the Structure Summary Table provided on Page 10 (437.938 acres or 455.668 acres). Please review and correct these inconsistencies as needed. (MSK)
104. Page 75 of Appendix 3.6-2, Surface Water Management SED CAD Reports SHLM, Pond 2 Impoundment Design shows the excavated capacity between elevations 2506.25' and 24992'. It is apparent that a decimal is missing from the second number. Please correct as necessary. (MSK)
105. The values on page 75 of Appendix 3.6-2, Surface Water Management SED CAD Reports SHLM, do not seem to correlate with corresponding information on page 76. Please review and correct as necessary. (MSK)
106. In Appendix 3.6-2, the impoundment designs for Pond 2 states the ponds will discharge at a rate of 7.65 ft/second with use of vegetated treatment to stabilize the spillway. When a flow velocity is over 5 feet/second, the Reclamation Division generally requires some alternative

type of erosion control to protect the surface. However, since this is calculated for a 100 year -6 hr. event, it may not be necessary. Please calculate the exit flow and velocity to meet the 25 year-6 hr. event (NDAC 69-05.2-16-09(9)) to show the spillway will be stable with vegetation under normal circumstances. If the flows are still over 5 feet/second, please address what additional measures will be taken to stabilize the spillway. (MDB)

## **Section 4.0 – Post-Mining and Reclamation Plans**

### **Subsection 4.1 – Reclamation Plan**

107. Please revise the narrative in the fourth paragraph in Section 4.1.1.6, Regrading, that states once the lignite coal is removed from the pit and the pit has been backfilled with overburden, the overburden material will be removed using a truck/loader/dozer fleet, etc. Please revise this narrative to accurately describe the proposed backfilling operation. (BEB)
108. Follow up to Item No. 291: The rule cite for submitting a grade approval request in the fourth paragraph of Section 4.1.1.6 is incorrect. The correct rules cite is NDAC69-05.2-21-06. Please correct. (MSK, ZAT)
109. Follow up to Item No. 354: Figure 4.1.7a, Post Mining Topography, indicates that one gentler sloped drainage into the South Branch Heart River in the SW ¼ of Section 22, whereas the Pre-mine Topography map shows two secondary drainage inlets into the Heart River at this location. In addition, there are very few defined secondary drainages draining north towards the Heart River in the N½ of Section 15. Please justify fewer secondary drainages in these locations or provide plans for replacing the secondary drainages in these locations. NDAC 69-05.2-21-02. (MSK)
110. Please revise the sentence in Section 4.1.1.7, Tract S-1399815A, Mary Louise Peters, et. al. that states that sediment pond 5 “will not be reclaimed” to state that sediment pond 5 will be “converted” to a developed water resource as per the surface owner’s request in accordance with NDAC 69-05.2-16-19. Also, add a statement that detailed design plans to convert this pond to a developed water resource which will be included in the permit prior to the conversion. (GAW)
111. The second sentence of Section 4.1.2.1 states that lignite coal production will be at a maximum annual rate of 2.4 million tons per year but the third paragraph of Section 3.1.1.1 states that up to 2.58 million tons might be mined. Please review and update for consistency. (GAW)
112. Follow-up to Item No. 297: Sentences in each of the Pit Area discussions in Section 4.1.2.1 state that “after mining has advanced five cuts (assumed to mean “pits”), a portion of the material from the out-of-pit overburden stockpile will be hauled back to the initial box cut...” This statement is inconsistent with other language that indicates that overburden from the pits will be hauled or placed into the adjacent mined out pits, and figures and tables that show compliance with contemporaneous reclamation requirements. Please clarify how stockpiled overburden can be placed in the box cut pit if the pits are increasing in size during the first few years of the permit term and the area is to be reclaimed in accordance with the contemporaneous reclamation requirements. (GAW)

113. Follow up to Item No. 301: The original deficiency was addressed; however, the 2011 values were used in the calculation. Please update Section 4.1 Worst Case Reclamation Liability to correspond with the most up to date variable costs. (MDB, MSK)
114. In Section 4.1.3.2, Assumptions for Associated Disturbance, a figure of \$6.00/ ton is used for the cost of gravel, however, currently the cost of gravel is about \$24.00/ton. Please correct this assumption. (MSK)
115. Follow up to Item No. 303: Section 4.1.3.2 was updated to remove the word subsoil but still states the roads will be built from “overburden that is to be used as topsoil/subsoil replacement.” Please remove the last portion of the statement (underlined above) to simply say “overburden”. (MDB)
116. Follow up to Item No. 304: Section 4.1.3.2 was updated to state a 60 foot road top width; however, this still appears incorrect when figuring a 2 foot depth and 92 road base with 4:1 side slopes as shown in the cross sections. At a 60 foot top width and 2 foot depth the road base would be 76 feet. If the average road base is 92 feet the average depth should be adjusted to 4 feet. Please make the necessary corrections. (MDB)
117. Follow up to Item No. 306: Mr. Sorensen sent an e-mail message and file concerning this deficiency prior to the March 30, 2012 response. The information provided in that e-mail is what was requested in the original deficiency. This information needs to be summarized in Section 4.1.5 for each pit. For example, from the cross sections provided:

Pit 5

Material to removed	9,569,261 Cubic yards
Material to be replaced	9,518,737 Cubic yards
Shortage of material	50,524 Cubic Yards
Percentage of total	0.53%

The difference between these two numbers should be the amount of coal removed from the pit less the amount of swell of the material. It is assumed this was done in the drawings. If not, it needs to be accounted for in the calculations. (MDB)

**Subsection 4.2. – Post-mining Land Use**

118. Please revise the wetland discussion on page 22 of Section 4.2.1 to indicate where the design plans are located for each post-mine wetland that is to be reclaimed (Appendix 4.1-2). Please reference a table in the narrative that shows the size and wetland type of each wetland that is to be reclaimed. Figure 4.1-7b shows the location of the planned reclaimed wetland and provides what appears to be the premine classification of the wetland. Please clarify what the label means for these reclaimed wetlands (DEMC, R4UB3x, etc.). (GAW)
119. A sentence on page 22 of Section 4.2 states that plans for roads and trails that are to be reclaimed will undergo the required public notice and public hearing process. Please be advised that PSC rules do not require public notice or public hearing process for the approval of plans for reclaimed roads. Please review and revise to clarify what is meant by this statement. (GAW)

120. In a number of instances in the landowner Post-Mining Land Use Preference discussions, Sections 4.2.2.1 - 4.2.2.23, there is a statement indicating that the pre-mine wetland acreage will be replaced to ensure future compliance with the 1985 Food Security Act provision. Please revise to state that the pre-mine wetland acreage is being replaced as required by NDAC 69-05.2-13-08 (6) and NDAC 69-05.2-09-17 (rather than the Food Security Act). (GAW)
121. Mary L. Peters appears to be requesting a pond in the southeast corner of Section 15 in her landowner preference statement (Appendix 4.2-1) but this request is not being fulfilled. Please discuss this request in the surface owner's preference statement discussion on page 25 of Section 4.2.2.7. The Reclamation Division believes that the west tributary should be re-established through a portion of the SE1/4 of Section 15 where it currently exists in the pre-mining condition so that the pre-mine surface water supply capabilities are being restored in this quarter section. NDCC 38-14.1-24 (9). (GAW)
122. Please review the land use acreage values listed in Section 4.2.2.24, Summary, and revise as necessary so that the values are consistent with the values listed in Table 4.2-2. The summary in Section 4.2.2.24 states that the cropland acreage increased 103.5 acres and that the tame pastureland and woodland amounts decrease by 96.3 and 1.3 acres respectively but Table 4.2-2 indicates otherwise. Likewise, Section 4.2.2.24, indicates there is a decrease of wetland acreage, but Table 4.2-2 shows an increase. The reference to the Revegetation Success Standards Section, II-H-10, in the narrative is also in error as it cites H-H-10 rather than II-H-10. Please correct as necessary. (GAW)

#### **Subsection 4.3 – Revegetation Plan**

123. Follow-up to Item No. 325: In the last sentence of the first paragraph of Section 4.3.6.1, please replace "... the precipitation data ..." with "... the yield data ..." as climatic correction method No.2 uses the control area yield rather than precipitation to calculate the climatic correction. (RLK)
124. The last sentence of Section 4.3.4.8, Other Land Use Areas, states that fish and wildlife lands (wetlands) are discussed in Section 4.3.6. However, Section 4.3.6 is the Sampling Methods and Success Standards section of the permit. Section 4.3.6.6 refers the reader to Section 2.9.2.3. Section 2.9.2.3 refers the reader to Section 4.1.1.2 for reclamation details, but Section 4.1.1.2 does not provide details regarding revegetating the reclaimed wetlands. Please revise the heading of Section 4.3.4.8 to clarify that "Other Land Use Areas" is really just Industrial Lands and include a separate Fish and Wildlife Habitat (wetlands) revegetation section in Section 4.3 that discusses reclaimed wetlands. (GAW)
125. Please revise Section 4.3.2, Revegetation Schedule, to clarify that SPGM respread completed outside of the growing season will be mulched and crimped to protect the soil from erosion. NDAC 69-05.2-15-04 (5). (GAW)
126. Follow-up to Item No. 313 and 335: The tame pastureland narratives in Section 4.3.2.2 and 4.3.4.2 state that the pre-cropland seed mixture will be planted on areas to be reclaimed to tame pastureland. However, most of the reclaimed tame pastureland that is to be reclaimed is located along the reconstructed west tributary drainage. The Reclamation Division believes that a more diverse mixture of native cool and warm season species, such as switchgrass, big bluestem and western wheatgrass, should be planted on this recreated ephemeral stream buffer area to ensure

stability and for compliance with NDAC 69-05.2-16-07 (4) which requires natural riparian vegetation on reconstructed stream channels. Please revise the existing tame pastureland seed mix or create another tame pastureland seed mixture for the tame pastureland that is to function as a buffer zone for a reconstructed stream channels. (GAW)

127. Follow-up to Item No. 313 and 335: Please revise heading and bookmark for Table 4.3-1 to clarify that the pre-cropland seed mixture will be used on areas to be reclaimed to tame pastureland not associated with reconstructed streams and revise Sections 4.3.2.2 and 4.3.4.2 to clarify compliance with NDAC 69-05.2-16-07 (4) which requires natural riparian vegetation on reconstructed stream channels where tame pastureland is to be planted adjacent reconstructed stream channels. (GAW)

#### **Subsection 4.4 – Predicting Potential for Re-establishing Vegetation**

128. Follow-up to Item No. 326: In the revised narrative added to Section 4.4.2 (page 56) discussing topsoil handling it states "... will be stockpiled or direct re-spread on final graded spoils." For topsoil, it would be more correct to indicate that direct re-spread would be on areas of respread subsoil. The statement also appears in similar narrative in Section 3.1.2.3. (RLK)

#### **Section 4.0 - Tables**

129. Follow-up to Item No. 313: Please revise the heading and bookmarks for Table 4.3-4, Temporary Area Seed Mix, to clarify that this mixture is also going to be used on reclaimed industrial lands. NDAC 69-05.2-05-02. (GAW)
130. Please consider revising Table 4.3-2, Basic Native Grassland Seed Mixture, to include a small percentage of suitable native forb species, such as blue flax, purple prairie clover, yellow coneflower and purple coneflower. Specific species and planting rates can be determined prior to seeding native grassland areas, but the permit, Table 4.3-2 and Section 4.3.4, should specifically state that a variety of forbs will be planted depending on availability and NRCS recommendations. (GAW)
131. Follow-up to Item No. 319: Please include a table in Section 4.0, Post-mining and Reclamation Plans, that identifies each reclaimed shelterbelt and clarify if it is a two, three or five row shelterbelt and label these shelterbelts on Post-mine Land Use Map, Figure 4.2-1. The shelterbelt planting table should list the size of each planting, the number of rows, distance between rows, species to be planted in each row and in-the-row spacing distance. The shelterbelt narrative in Section 4.3.4.6 states that introduced and native trees and shrubs will be used. However, Mary Louise Peters asked in her preference statement that only native trees be planted in the shelterbelts on her property. Please review and revise as necessary. (GAW)
132. Section 3.5.1.2, Haul Roads, Access Road and Coal Ramp Plan, indicates that a portion of ESAR 1 will be constructed in the initial phase but it is not included on Table 4.1-4. Please include it in the reclamation schedule since it will be used for hauling coal and is considered a primary road. (MDB)

#### Section 4.0 - Figures

133. On Figures 4.1-8 and 9; Pre-Mining Slope Map & Post Mining Slope Map, please depict the lower reach of the West Tributary of the South Branch of the Heart River. As currently depicted on both maps, it does not “connect” to the South Branch of the Heart River. (MSK)
134. Follow up to Item No. 334: In recalculating the Worst Case Bond estimate, it was assumed that Stockpiles 5 and 7 were left in place for the reclamation of the explosives storage area and access road and, therefore, would not require a significant haul distance. Please depict the stockpiles on Figure 4.1-5a. If this not the case then the haul distance required to respread these areas, as well as the total bond amount, will need to be increased. (MDB)
135. Follow-up to Item No. 345: Figure 4.2-1, Post-Mining Land Use Map, and Table 4.2-1, Pre- and Post-Mine Land Use Acreage, indicate that the haulroad that is to be constructed along the east edge of SE1/4 of Section 28 will be retained, presumably as a public road. Please revise plans to show the reconstructed section line road on the actual section line between Sections 27 and 28 and the former haulroad corridor reclaimed to the pre-mine land use(s) as requested by the surface owner. The narrative in Section 4.2.2.19 indicates that the section line road will be reestablished, but the Table 4.2-1 indicates that there will be 6.13 acres of public road on this tract (rather than 4.0 acres of statutory right-of-way) and the road is not shown on the section line. The narrative in Section 4.2.2.24 may need to be revised as well as the acreage listed in Table 4.2-2. Please review and update as necessary. (GAW)
136. Figure 4.2-1, Post-Mining Land Use Map, shows that a shelterbelt is going to be planted on a significant portion of the recreated West Tributary of the South Branch of the Heart River stream channel in the SE1/4 of Section 16. Please alter the location of the stream or this tree planting so that the tree planting is not in the recreated drainage channel. (GAW)
137. Figure 4.2-1, Post-Mining Land Use Map, identifies the West Tributary and the South Tributary as “Permanent Diversions”. These recreated ephemeral stream channels are not “diversions” as they are not “diverting” water but rather transporting water through a recreated drainage way in a manner that existed prior to mining. Please revise the legend on the Post-Mine Land Use Map and the labels and legend of Figure 4.1-7b so that these recreated drainages are not referred to as “diversions”. Likewise, please revise the language in the preference statement discussion in Section 4.2.2 where these tributaries or drainages are incorrectly referred to as postmine diversions. NDAC 69-05.2-01-02. (GAW)
138. Follow-up to Item No.343: The planned location for the re-established West Tributary is shown on several post-mining maps as entering Section 22 in the NE1/4NW1/4, and proceeding eastward to the approximate location of the existing pond in the NE1/4NE1/4 of Section 22. The re-established tributary segment does not appear to coincide with the post mining topography as depicted on Figure 4.1-7a – Post-mining Topography and Figure 4.1-7b – Permanent Impoundments, Re-Established Channels and Wetland Restoration. The post-mining contours suggest that the tributary segment would more naturally fit the post-mine landscape by following a course similar to the pre-mine condition and entering Section 22 in the NE1/4NE1/4. The course for the re-established West Tributary as shown on Figure 4.2-1, Post Mining Land Use, isolates a triangular tract of cropland in the N1/2 of Section 22 which did not exist prior to mining and would be impractical to farm. The planned location for the

reestablished drainage channel would also remove a potential surface water source from the SE1/4 of Section 15. Please consider revising the location of the reconstructed west tributary segment to follow the planned post-mining landscape and to adhere to NDAC 69-05.2-16-01(1). (RLK, MSK)

139. SHLM is proposing reclaiming cropland on slopes exceeding 15 percent in the E1/2 of the NW1/4 of Section 16, according to Figure 4.1.7a, Post-mining Topography. Please reduce the slopes in this area to less than 9 percent, which is the upper limit that we normally accept for cropland. We realize that a steep hill existed in this area pre-mining. (GAW)
140. Follow-up to Item No. 351: Please revise the Developed Water Resources design plans in Figure 4.1-7c to show that the depth of the stock ponds will be deeper than 4 feet. The preliminary design plans in this table in Figure 4.1-7c shows that many of these ponds will only be 2 feet deep and three have watersheds less than 17 acres in size. Please revise to show that all of these developed water resources will have watersheds at least 40 acres in size (NRCS recommendation) and that they will be deep enough to hold water to meet the requirements of NDCC 38-14.1-24(7). We recommend that reclaimed stock ponds be at least 6 feet deep and have enough water storage to accommodate seasonal livestock use. (GAW)
141. It appears that sediment ponds are being depicted on Figure 4.1-7c rather than stockponds or developed water resources as the map title indicates. A haulroad is shown on the topographic map adjacent Pond 22SW2. Please revise to show the approved post-mining topography adjacent to these ponds and revise as necessary to depict the postmining stockponds or developed water resources. (GAW)
142. Please label every reclaimed developed water resource, non-temporary wetland, shelterbelt and woodland on the Post-Mining Land Use Map, Figure 4.2-1. (GAW)

#### 4.0 – Appendices

143. Table 5 of Appendix 4.1-1, Facility Demolition and Removal Costs, does not include the cost to remove the bridge crossing the South Branch of the Heart River. An acceptable estimate of the removal costs is 20% of the cost to design and construct it. Please include costs for the removal of the bridge since it is mining related disturbance. (MSK)
144. Follow up to Item No. 370: Table 4 of Appendix 4.1-1 indicates 74.8 acres of native grasslands need to be seeded during reclamation. However, there is no cost associated with the actual seeding of this mixture under the “Type of Work” heading. It is assumed that it was included in with the pasture/precropland rate, but native seedings are required to be calculated at a rate 1.5 times the small grains seeding rate. Please correct. (MDB) (This has been accounted for in our calculations as discussed below.)
145. The Reclamation Division believes the worst case bond calculations as provided in Appendix 4.1-1, Bonding Calculations, are underestimated, particularly those in Table 2. Figure 4.1-5a, Worst Case Bonding Map, only shows three SPGM stockpiles of SPGM and 1SOVB stockpile of requiring to be respread in the worst case condition. The haul distances that were used for these four stockpiles were underestimated, so we recalculated these values as well as the volumes of each of these stockpiles. Since the volumes of each stockpile are not known at this time, we estimated the stockpile volume based on the worst case condition and where the

material would most likely be respread to. Two additional stockpiles, nos. 5 and 7, were also added to the inventory to help aid in the haul distance for the disturbance to the north. An average topsoil respread thickness of 7.7 inches as stated in Section 3.1.2.3 and the total respread thickness from Figure 3.1-5g were used in the calculations. Haul distances were calculated from the center mass of the pile to the center mass of the area which required respreading via haulroad or ramp. The attached table shows our worst case reclamation cost estimate. Feel free to use these tables or to incorporate them into your cost estimate as appropriate. However, they will need to be updated to reflect the July 2012 variable costs. (MDB)

Topsoil Respread						Scraper		Truck Hrs		Loader Hrs.	
Respread Area	Stockpile Location	Acres	Depth	Volume	Distance	Productivity	Hours	Productivity	Hours	Productivity	Hours
Final Pft, Area 1	TS 9	40.4	7.7	41,823	8,900			222.4	188.1	889.6	47.0
Final Pft, Area 2	TS 9	46	7.7	47,620	10,000			207.6	229.4	830.4	57.3
Final Pft, Area 3	TS 9	46.3	7.7	47,931	13,100			173.1	276.9	692.4	69.2
SOVB-10 pile	TS 9	8.7	7.7	9,006	15,500			151.7	59.4	606.8	14.8
Pile TS 13 and access	TS 13	6.9	7.7	7,143	1,000	481	14.9				
Piles SS10 and TS 9	TS 9	8.3	7.7	8,592	400	669	12.8				
Piles SS 5 and TS 7	TS 7										
OVB 1 Pile	TS 9	30.6	7.7	31,678	3,800	282	112.3				
Collection ditch 2a	TS 9	20.1	7.7	20,808	11,000			194.7	106.9	777.6	26.8
MHR1	TS 13	47.5	7.7	49,173	1,200			182.9	268.9	731.6	67.2
MHR2 (to 39+50)	TS 13	14.6	7.7	15,114	7,900			239.9	63.0	959.6	15.8
ESAR and storage area	TS 7	34.4	7.7	35,612	4,300	259	137.5				
CHR1, CHR2, CHR3	TS 9	7.7	7.7	7,971	8,100			239.9	33.2	959.6	8.3
Pond 1	TS 9	19.6	7.7	20,290	4,500	251	80.8				
Pond 2	TS 9	12.8	7.7	13,251	8,300			231.1	57.3	934.4	14.2
Mine support Facilities	TS 9	9.5	7.7	9,835	4,300	259	38.0				
<b>Totals</b>		<b>353.4</b>		<b>365,848</b>				<b>396.3</b>		<b>1,283.0</b>	<b>320.6</b>

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Subsoil Respread						Scraper		Truck Hrs		Loader	
Respread Area	Stockpile Location	Acres	Depth	Volume	Distance	Productivity	Hours	Productivity	Hours	Productivity	Hours
Final Pit, Area 1	SS 10	24.7	16.3	54,129	8,700			222.4	243.4	889.6	60.8
		5.7	40.3	30,883	8,700			222.4	138.9	889.6	34.7
				0							
Final Pit, Area 2	SS 10	2.4	16.3	5,259	9,750			207.6	25.3	830.4	6.3
		34.2	40.3	185,299	9,750			207.6	892.6	830.4	223.1
				0							
Final Pit, Area 3	SOVB -10	0.1	16.3	219	3,200	315.0	0.7				
		36.5	40.3	197,761	3,200	315.0	627.8				
				0							
				0							
OVB-1	SS 10	10.7	16.3	23,448	3,800	282.0	83.2				
		19.9	40.3	107,820	3,800	282.0	382.3				
Collection ditch 2a	SS 10	13.1	16.3	28,708	11,000			194.7	147.4	777.6	36.9
		7	40.3	37,927	11,000			194.7	194.8	777.6	48.8
MHR1	SS 10	1.8	16.3	3,945	9,000			222.4	17.7	889.6	4.4
		10.5	28.3	39,950	9,000			222.4	179.6	889.6	44.9
		35.3	40.3	191,259	9,000			222.4	860.0	889.6	215.0
MHR2(to 39+50)	SS 10	4.8	16.3	10,519	800	531.0	19.8				
		9.8	40.3	53,097	800	531.0	100.0				
ESAR and storage area	SS 5	15.8	16.3	34,625	3,800	282.0	122.8				
		1.5	28.3	5,707	1,000	481.0	11.9				
		17.1	40.3	92,650	3,800	282.0	328.5				
Pond 1	SS 10	14.3	28.3	54,408	4,300	259.0	210.1				
	SS 10	5.3	40.3	28,716	4,800	240.0	119.6				
Pond 2	SS 10	12.8	40.3	69,352	8,100			239.9	289.1	959.6	72.3
Mine support Facilities	SS 10	9.5	40.3	51,472	4,100	268.0	192.1				
<b>Totals</b>		<b>283.3</b>		<b>1,255,683</b>				<b>2,006.7</b>		<b>2,988.8</b>	<b>747.3</b>

Overburden				Scraper		Truck Hrs		Loader	
Respread Area	Stockpile Location	Volume	Distance	Productivity	Hours	Productivity	Hours	Productivity	Hours
Final Pit, Area 1	OVB-1	828,800	7,500			249	3,328.5	966	858.0
Final Pit, Area 2	OVB-1	828,800	8,700			222.4	3,726.6	889.6	931.7
Final Pit, Area 3	OVB-1	828,800	12,000			182.9	4,531.4	731.6	1,132.9
Final Pit, Area 1	ESAR	195,122	14,500			159.9	1,220.3	639.6	305.1
Final Pit, Area 2	MHR1 and MHR2	124,057	6,500			272.2	455.8	966	128.4
Final Pit, Area 3	MHR1	124,057	6,000			284.8	435.6	966	128.4
Pit 1	Pit 1	1,301,706	4,100	268	4,857.1				
Pit 1	Pit 1	1,301,706	2,400	291	4,473.2				
<b>Total Overburden</b>		<b>5,533,048</b>			<b>9,330</b>		<b>13,698</b>		<b>3,484</b>

**Earth Moving Total Costs**

Equipment Hours		Dozer (D11)	Scraper (657)	993k Loader	777 Trucks	Dozer D9	Grader (16M)	Water wagon
Topsoil			396.3	320.6	1,283.0	320.6	386.7	139.9
Subsoil			2,006.7	747.3	2,988.8	747.3	1,081.8	416.3
Spoil		1,447.0	9,330.0	3,484.0	13,698.0		5,039.0	
<b>Total Equipment Hours</b>		<b>1,447.0</b>	<b>11,733.0</b>	<b>4,551.9</b>	<b>17,969.8</b>	<b>1,067.9</b>	<b>6,507.4</b>	<b>556.2</b>
Equipment Hourly cost		\$341.03	\$346.48	\$302.57	\$263.70	\$200.52	\$148.93	\$148.93
Subtotal Equipment Costs		\$493,470.41	\$4,065,249.84	\$1,377,268.38	\$4,738,636.26	\$214,135.31	\$969,147.08	\$82,839.83
<b>Total Equipment Costs</b>								<b>\$11,940,747.11</b>

## Final Costs Summary

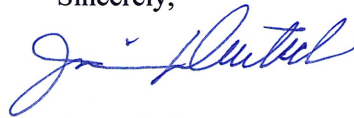
Earth Moving Costs			\$11,940,747.11
Revegetation Costs			\$202,983.00
Culvert and Gravel for public road reconstruction			\$72,612.00
<b>Subtotal</b>			<b>\$12,216,342.11</b>
Demolition and Removal Costs			\$359,556.00
<b>Engineering and Design Costs</b>		<b>Cost/ acre</b>	<b>Acres</b>
	Preparation of pre-reclamation topography	\$10.00	4581.4
	Preparation of plans and specifications	\$25.00	584
	Preparation of Final Topography	\$5.00	4581
	Comparison of topography maps	\$10.00	584
<b>Subtotal of Engineering and Design</b>			<b>\$89,159.00</b>
<b>Overhead costs</b>			
	Direct field Supervision	10% of first \$200,000 in Redamation cost	\$20,000.00
		1% of additional reclamation costs	\$124,650.57
	1% Miscellaneous Costs		\$127,205.49
		<b>Total Cost</b>	<b>\$12,936,913.17</b>

**Section 5 – References Cited**

146. Follow-up to Item No. 376: We have noted that (Houghton, R.L., 1982) and (Houghton, et.al, 1987) have been added to the list of references under the Geology and Ground Water Hydrology sections of the application with submission of South Heart Coal's March 30, 2012 technical review response. The work of Houghton's co-authors, Thorstenson, Fisher, and in particular, Groenewold (Houghton, et.al, 1987) have contributed immensely to the science and understanding of geology and ground water resources in the state of North Dakota. Unfortunately the work of R. L. Houghton and references to his work have been wholly disregarded by numerous state and federal agencies due to apparent issues regarding fabrication of research data and reports during Mr. Houghton's tenure with the Water Resources Division, USGS. To the extent possible we ask that you please remove all data and reference information attributed to Robert L. Houghton from the permit application. (BEB)

If you have any questions, please contact this office.

Sincerely,

A handwritten signature in blue ink, appearing to read "James R. Deutsch".

James R. Deutsch  
Director  
Reclamation Division

cc: Stark County Auditor