



COLORADO
Division of Reclamation,
Mining and Safety
Department of Natural Resources
Rm 215
1001 E 62nd Ave
Denver CO 80216

October 31, 2023

Chris Zadel
Northern Colorado Constructors, Inc. Aggregate Div
9075 WCR 10
Fort Lupton, CO 80621

RE: Adequacy Review #2; Technical Revision (TR9); NCCI Pit #1 – File No. M-2001-107

Chris Zadel:

The Division has reviewed the above referenced amendment adequacy review response letter and material submitted. The following is a list of the adequacy review items from the Division's October 16, 2023 first adequacy review letter followed by the response provided by North Colorado Constructors, Inc. Aggregate Div. (NCCI). If additional information or revision is required it will be noted. If an item is resolved, that will be indicated.

During our groundwater specialist's review of the material submitted, the Division determined that additional issue(s) of concern need to be adequately addressed before the Technical Revision can be considered for approval. This additional adequacy items list is attached below.

1. TR9 includes submittal of an updated monitoring well map. This shows the location of seven wells, labeled MW-Z1 through MW-Z7. Three of these wells are within the NCCI Pit #1 boundary and four wells are located to the south and west of the pit. The monitoring well map previously submitted to the Division in 2011 shows ten monitoring wells at the NCCI Pit #1 site, labeled MW#1 through MW#10. Baseline water levels for the original monitoring wells MW#1 – MW#10 were established using data collected from weekly measurements beginning January 1, 2007 through December 31, 2010. This data would accurately depict water levels at the site before any dewatering activities occurred. Baseline water levels derived from this data were approved under TR5. Water level data submitted with TR9 shows water level data for MW-Z1 – MW-Z7 beginning in August 2010.

Please clarify for the Division when, why, and how MW#1 – MW#10 were destroyed and why MW-Z1 – MW-Z7 were chosen to replace water level monitoring at the site. Please provide a rationale for how the new wells provide an accurate representation of water levels at the site under dewatered and non-dewatered conditions, since baseline non-dewatered conditions were originally set with data from 2007 – 2010 and conditions at MW-Z1 – MW-Z7 begin in 2010.



NCCI Response: The monitoring wells MW#1-MW#10 were removed or taken out due to being in conflict with the excavation limits for the clay liner. Prior to removing these wells it was decided that the City of Thornton would install additional monitor wells MW-Z1-MW-Z7 and would monitor those wells. NCC also kept monitoring wells around the pit where possible until they had to remove in order to excavate to the limits of construction for the clay liner (See Appendix C of the ground water modeling report). The MW-Z1-MW-Z7 wells were placed such that the locations were outside the limits of excavation for the clay liner and in locations where upgradient and down gradient ground water elevations could continue be monitored for the existing condition of the mine as well as the future condition of the mine once the clay liner was completed.

Division Response: Resolved

2. Page 1 of the submitted hydrologic report states that as of November 2020 the south pit at the NCCI Pit #1 site has, “been dewatered by pumping for approximately the last 10 years”. To allow the Division to more precisely interpret monitoring well water level data, please provide the exact month and year that dewatering begin at the NCCI Pit #1 south pit. The site was permitted in 2001. If de-watering did not occur in this year, please explain why.

NCCI Response: The initial phase of the mining required stripping overburden and topsoil and then mining of the surface gravel commenced after the permit approval in 2001. The de-watering commenced in October 2003.

Division Response: Resolved

3. The baseline levels for the original monitoring wells MW#1 – MW#10 were established using data collected from weekly measurements beginning January 1, 2007 through December 31, 2010. The Division is of the understanding that this data would depict water levels at the site before any dewatering activities occurred. Baseline water levels derived from this data were approved under TR5. In order to accurately determine a change in water levels at the NCCI Pit #1 from pre-mine to post-mine conditions, the Division would need to compare current data from MW#1 - #10 to this baseline data. However, since data from these wells it not available, please clarify for the Division how potential water level impacts are being monitored at the site. Who is conducting water level monitoring? Is NCCI tracking this information in order to adhere to the trigger level stipulation approved under TR5. For reference, this stipulation reads: “NCCI will notify the Division in writing within 48 hours in the event the monthly averages of any of the monitoring wells exceeds the upper or lower levels by 24 inches for three consecutive months.”

NCCI Response: The data from monitoring wells MW#1, MW#2, MW#3, MW#4, MW#7, MW#8 were monitored starting in 2003 and should be considered the pre-mining levels as shown in Appendix C of the groundwater modeling report. The impacts have been

monitored and data is provided in Appendix C of the ground water model report. The potential impacts are included in the text of the ground water model report and the impacts at the site are continuing to be monitored utilizing the groundwater level data from MW-Z1, MW-Z2, MW-Z3, MW-Z4, MW-Z5, MW-Z6, and MW-Z7. The City of Thornton has been collecting the data for the MW-Z1-MW-Z7 wells and providing to Northern Colorado Constructors. Northern Colorado Constructors has been providing this data with the annual reporting to the DRMS. Now that the clay liner is completed, dewatering has stopped, and the North Cell is being backfilled, we would suggest monitoring the MW-Z1-MW-Z7 wells on a monthly basis (as the City of Thornton is currently doing) as part of this Technical Revision No. 9.

Division Response: Resolved

4. Page 10 of the submitted hydrologic report states “We again used a predevelopment run with no pits present for a baseline reference case (pre-development conditions). We selected the late July 2019 water table as the baseline month for the change comparison (Figure 9) since late summer is when we expect the highest water levels west of the NCCI pits due to recharge from LDC and LBD which is also when we expect the highest drain flow. This is the baseline against which changes are evaluated in the remainder of this report.” Please clarify what conditions Figure 9 and the 2019 data used to create it represents. Does this figure show pre-development and pre-dewatering conditions? Post slurry wall construction conditions? De-watered conditions?

NCCI Response: Figure 9 represents the predevelopment (pre-dewatering), high (July) water table. It was used to create Figures 11 and 13. Figure 10 then represents the high water table in July, 2019 while the NCCI pit was being dewatered. It was used to evaluate the maximum amount of drawdown that dewatering created (Figure 11).

Division Response: Resolved

5. Additional adequacy items are listed below.

Please submit your response(s) to the above listed issue(s) by **November 6, 2023**. If the above items cannot be addressed by November 6, 2023, please request an extension to the decision due date in order to ensure adequate time for the Division to review the materials. If any adequacy issues remain by the decision due date the Division may deny your request.

If you require additional information, or have questions or concerns, please feel free to contact me at 720-868-7757 or hunter.rildey@state.co.us

Sincerely,

Hunter C. Ridley

A handwritten signature in blue ink that reads "Hunter Ridley". The signature is written in a cursive style with a large initial "H" and a stylized "R".

Environmental Protection Specialist

CC: Michael Cunningham, DRMS

Date: October 31, 2023

To: Hunter Ridely, DRMS

From: Patrick Lennberg, DRMS

**RE: NCCI Pit #1, TR-9 Review, Water Level Change and Pit Drain Evaluation Report,
Review Memo, File No. M2001-107**

On October 16, 2023, I was requested to review the Water Level Change and Pit Drain Evaluation in the Vicinity of the NCCI Pit Report submitted through TR-9 for the NCCI Pit #1. I also reviewed monitoring well groundwater level measurements that were submitted to the Division as part of an adequacy review response. Below are follow-up questions that should be addressed.

1. Observations and inferences, item 1 indicates the water table east of the NCCI pit is influenced by the Lupton Bottom Ditch (LBD) and Little Dry Creek (LDC). However the Division believes the water table in this area is more influenced by the South Platter River (SPR) and another un-named ditch that runs between the pit and the SPR, please comment.
2. Observations and inferences, item 3, it is stated that the LBD is responsible for the seasonal recharge in wells MW-Z1 and MW-Z2 as large as 8 feet, what observations is this based off of? A review of the discharge records for the LBD it indicates peak discharge typically occurs in June yet peak groundwater levels, in Z1 and Z2, typically occur in September. Additionally, the groundwater elevation data submitted to the Division show other site monitoring wells (MW-Z3, -Z4, and -Z5) also have documented large seasonal fluctuations of groundwater levels in them that cannot be solely attributed to the LBD.
3. The report states, in item 4, that site dewatering pumping rates increased in the summer months due to leakage from LBD and LDC. The report goes on to state, in item 6, that the LDC has no connection to groundwater due to the type of vegetation present in the ditch. Finally, in item 10, it is stated that the LDC has no connection to groundwater as suggested by the model. Please clarify the discrepancy between items 4 and 6 and provide an explanation how the model reflects there is no connection when it appears the model was run on the assumption there was connection between the LDC and groundwater.
4. Observations and inferences, item 6, a review of historic aerial imagery indicates that LDC had no areas of ponding near the NCCI permit boundary. Beginning in 2005, around the time when



dewatering activities began at the pit, ponding areas appear immediately adjacent to and within the permit boundary. Until recently the Operator had been directing their pit dewatering discharge to the LDC. These ponding areas have developed over time and persist to what is currently seen at the site. The Division believes that dewatering at the site has caused these ponding areas due to the Operator's discharge into a low gradient surface water flow regime unaccustomed to the increased flows. Additionally, in Figure 7 the modeled increase in groundwater adjacent to the permit boundary in this area of ponding is approximately 4 feet. The Division believes there is a possibility that the ponding water may actually be groundwater exposed at the surface along with surface water. Please comment.

5. Observations and inferences, item 8, states the LGE lined pits to the south have caused approximately 3 to 4 feet of groundwater decline on the east side of the NCCI south pit. A review of the water levels associated with MW-4Z, -5Z and -6Z all show an increase in overall levels since 2020. Please comment on the increase in levels seen within these wells.
6. Observations and inferences, item 9, states the NCCI south pit liner will only create a one foot rise in groundwater levels on the west side of the pit. However, in Figure 7 there is a 3 to 4 foot modeled increase in groundwater levels, please clarify this discrepancy.
7. Discussions, on page 5 of 35, last sentence of the first paragraph states installing the underdrain could be perceived as a greater problem. Why?
8. Recommendations, on page 5 of 35, the Division believes these recommendations are not accurate given current site observations and need to be revised. Please revise the recommendations.
9. Impact Summary, page 9 of 35, the Division does not believe the mounding being caused by the NCCI South Pit is being cancelled out by the shadowing effects of the LGE pits. Did the model take into account any potential mounding and shadowing mitigation measures being implemented at the LGE pits?
10. Summer Water Table Baseline Run, page 10 of 35, the model was calibrated using groundwater elevations collected from MW-Z1 and MW-Z2 in July 2019 and that level is 4861 feet. A review of the groundwater level data provided, looking at measurements from the months June, July, and August between 2010 and 2019 indicates the average groundwater elevations to be approximately 4862.4 feet which is 1.4 feet higher than what the model was calibrated to. Additionally, the groundwater data provided to the Division indicates that there were no groundwater level data was collected in July 2019. Please provide a detailed explanation of what the impacts would be to the model using a more representative higher groundwater elevation for calibration.

Of the data collected during the three months above (June, July, and Aug) between 2010 and 2019 the average groundwater elevation was 4862.44 feet, minimum elevation was 4859.35 feet and the maximum was 4866.38 feet. All this collected data has been obtained while the pit(s) were actively being dewatering therefore the data is believed to be biased low. Why is it appropriate to calibrate a model using potentially depressed groundwater elevations due to pit dewatering?

11. Figures 9 and 10 need additional clarification. Both Figures are stated to be calibrated to July 2019 groundwater elevations, however the 4861 contour does not appear to be correctly placed in Figure 9 and the contours do not match with the observed groundwater elevations in Figure 10 (e.g. the 4861 contour should intersect with MW-Z1 and MW-Z2 and it does not).
12. April 2022 to July 2022 there is a sudden increase in groundwater elevations across the site, please explain what occurred at the site that accounts for the sudden increase.
13. A review of the groundwater elevations for MW-Z1 and MW-Z2 for 2023 shows that groundwater elevations came within one foot of the ground surface. Prior to June 2022 the average depth from ground surface to groundwater was 9.2 feet. The Division believes the Operator is no longer minimizing disturbances to the hydrologic balance pursuant to Rule 3.1.6. The Operator shall within 60 days of the date of this letter submit a Technical Revision detailing what mitigation measures (e.g. French Drain) will be implemented to address groundwater mounding in the area, construction schedule for installation, and a new groundwater model demonstrating the effectiveness of the proposed mitigation measures.

If you need additional information or have any questions, please let me know.

Sincerely,



Patrick Lennberg
Environmental Protection Specialist

cc: Jared Ebert, DRMS