COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

1313 Sherman Street, Room 215
Denver, CO 80203

July 5, 2018

Don Summers
Todd Creek Village Metropolitan District
10450 E. 159th Court
Brighton, Colorado 80602

RE: Signal Reservoir No. 1 Expansion, DRMS Application No. M-2017-013
Adequacy Review No. 3

Dear Mr. Summers,

The Colorado Division of Reclamation, Mining, and Safety (Division or DRMS) received Todd Creek Village Metropolitan District's (TCVMD) hardcopy response to the Division's second adequacy review on July 2, 2018. Below is the list of adequacy review issues that were identified followed by TCVMD's response to the items. If additional information or clarification is needed, the Division's response indicates this. Adequacy review items that have been resolved are not listed. Also, an additional adequacy review item has been identified based on your response to the Division's adequacy review. This item is listed at the end of this letter.

Adequacy Review No. 2 Items:

I. Per the DWR comment letter, the proposed reservoir expansion operation will not qualify the reservoir for storage if the expansion occurs below the groundwater level. Therefore in order for the reservoir to be approved for water storage the operator must line the reservoir and perform a liner leak test in accordance with the August 1999 State Engineer Guidelines for Lining Criteria for Gravel Pit (1999 SEO Guidelines) once mining is complete and the site is at final grade. Does TCVMD anticipate needing to line the reservoir to prevent the inflow of groundwater? If so, please provide a plan for lining the reservoir and provide a cost estimate for the installation of the liner.

   a. **TCVMD Response:** TCVMD does not anticipate needing to line the reservoir to prevent the inflow of groundwater. We have attached a subsurface exploration report for Signal 1 Reservoir modifications improvements prepared by Earth Engineering Consultants. The purposed of this study was to investigate if material located in the reservoir area was suitable for use in the core of the high hazard Signal No. 1 Dam Rehabilitation project. Please see the bore logs included in this report which indicate that the subsurface materials consist mostly of lean clay with sand, clayey sand, sandy fat clay, siltstone/Claystone bedrock. It was determined that these materials are suitable for use in the impermeable core for the high hazard Signal No. 1 dam rehab project. Due to the lack of pervious materials (sands and gravels), TCVMD does anticipate need to line the bottom once excavation is completed. The material being excavated is considered liner

grade material. It should also be noted that water was only encountered in 5 of 17 bore holes at depths ranging from 25 to 38 feet below existing site grade. It is our opinion that this water is likely zones of perched and or trapped water present in the relatively impervious bedrock and or fractures/fissures within the bedrock formations as noted in the EEC report. TCVMD is anticipating that the vast majority of any water that may be encountered during excavation will have originated from the very slow seep of water from Signal 2 Reservoir located immediately east of the permit area. The Signal 2 Reservoir is the only regular source of water located within 1000 feet of the permit area. TCVMD is aware and will comply with the State Engineer Guidelines for Lining Criteria for Gravel Pits. If water is encountered during excavation, the water will be metered and measured to compare the amount of water observed to the August 1999 State Engineer Guidelines for Lining Criteria for Gravel Pits.

b. **DRMS Response:** According to the Earth Engineering Consultants report, the on-site overburden cohesive soils and underlying bedrock material would be suitable for use as a low permeability earthen embankment/liner material. However, page 13 of the report indicates that to minimize the potential for groundwater fluctuations to impact and/or enter the "re-configured" reservoir, the bottom of the pond should have a minimum of a 3-foot separation above the maximum anticipated rise in groundwater and/or a minimum 3-foot layer of cohesive liner material should be placed and compacted along the reservoir bottom. Also, page 14 of the report states that the embankment (excavation perimeter) surrounding the pond should be lined as part of the wetted perimeter and then discusses how the liner material should be placed in lifts and compacted. Given this and the DWR's requirements, the bottom of the reservoir will either need to be lined or the Operator will need to construct the bottom of the pond to be at least 3 feet above the anticipated rise in groundwater level. Please either provide a plan to place and compact a liner as specified in the report or revise the mining and reclamation plan and associated maps so that the bottom of the reservoir will be at least 3 feet above the anticipated groundwater level.

II. If a pit liner will be installed, please evaluate the flow of groundwater in and around the lined reservoir. Please model if groundwater mounding or shadowing will occur and evaluate the impacts this may have on the hydrologic balance within and adjacent to the affected land. Please provide a plan for minimizing the impact of the hydrologic balance and provide a plan for protecting off-site areas from damage.

a. **TCVMD Response:** As stated above, the excavated material and end product at proposed grade consists of liner grade clay and or bedrock material. We will not need to construct a liner to prevent groundwater entering from a pervious material (i.e. sand and gravel). The proposed condition is such that clay and or bedrock is the final surface.

b. **DRMS Response:** As discussed in the item above, TCVMD may need to place and compact liner material on the bottom of the reservoir. Based on the Division's review of the geologic setting discussed and the nature of the subsurface material and bedrock, it is

not likely the placement of a liner would cause groundwater mounding or shadowing in this instance. Given this, this item is considered resolved.

Reclamation Cost Estimate

Depending on TCVMD's response to the above items, a compacted clay liner may need to be installed at the site in order for the final excavation to function as a reservoir in accordance with the approved post mining land use. If the operator exposes groundwater, the Division would need to hold a bond to install the clay liner. The Division has conducted a reclamation cost estimate for the installation of the clay liner. This estimate is attached for TCVMD review. In lieu of bonding for the installation of the clay liner, the applicant could first obtain a permanent plan for augmentation from the Colorado Division of Water Resources. If this option is chosen, the applicant would have to commit to not exposing groundwater until they have obtained a permanent plan for augmentation and supplied documentation to this effect to DRMS.

If the option to bond for the installation of the clay liner is chosen, please review the Division's cost estimate and indicate if you concur with the estimate. TCVMD has already supplied a $75,000.00 financial warranty in the form of a Certificate of Deposit for the operation. Prior to the issuance of the permit, TCVMD would need to provide additional financial warranty to cover the cost of the installation of the clay liner.

The Division is required to issue a decision to approve, approve with conditions or deny the 111c application by July 17th, 2018. If you need additional time to address the adequacy review issues noted above, please request an extension of the decision date. If you have any questions feel free to contact me at (303) 866-3567, extension 8120.

Sincerely,

Jared Ebert
Environmental Protection Specialist III

Enclosures: *1.) July 5, 2018, DRMS Reclamation Cost Estimate*

EC: Don Summers, Todd Creek Village Metro. District, don@pssmail.com