



Interoffice Memorandum

To: Janet Binns, Travis Marshall, Jim Stark

From: Rob Zuber *Rob D. ZL*

Date: 7 February 2020

Subject: King Coal, Permit C-1981-035,
Conference call regarding groundwater Points of Compliance

On February 7, 2020, I participated in a conference call with GCC Energy staff (Tom Bird and Sarah Vance) and their hydrology consultant (Landon Beck of Resource Hydrogeologic Services) to discuss potential groundwater points of compliance (POCs) for the King Coal Mine. The purposes of the call were to:

- Discuss the background of monitoring wells at the mine, especially those associated with TR-26
- Revisit past discussions related to POCs
- Discuss a path forward for determining the specifics of POCs at King Coal Mine.

I made it clear to GCC and Mr. Beck that this conference call was just an initial discussion. The Division needs to look more closely at AHR water quality data, and we need to have internal meetings (including myself, a hydrogeologist, and managers) before making any decisions or developing a final plan for POCs at this mine.

A summary of the key points of this conference call follows. While reading this memo, it is useful to look at Map King II-012 from the PAP. (This map was updated with TR-26 in 2016 and last approved with RN-07 in 2017.)

Background of Monitoring Wells

I asked GCC and Mr. Beck to discuss how locations of well clusters were chosen, before the submittal of TR-26. Of particular interest are the ones that are down gradient (MW-3 Cluster and MW-4 Cluster), since these are most relevant for a POC discussion. In particular, why were they not closer to the permit boundary? What was the role of land access in the decisions? What was the role of potential Lease Modification lands?



Mr. Beck indicated that prior to and during the TR-26 process extensive discussions took place between himself, GCC, the Division, and OSM. These included detailed discussions of the best locations and the feasible locations of the well clusters, which were a primary purpose of that technical revision. He indicated that the locations were chosen because of hydrogeology and access constraints. Regarding hydrogeology, in some ways having a monitoring well further away from mine workings is beneficial, because a well that is too close to the mine may not accurately assess the complete condition of the groundwater. For example, a plume of groundwater with high concentrations of dissolved metals may not be detected if the plume flows around a well that is too close to the source. Regarding the access issue, he indicated that some landowners were not amenable to having the wells on their properties; this included the Weidemann property, which would have been an ideal location.

Mr. Bird added to the discussion, providing three reasons for not locating a well cluster on the BLM land in Section 35, which would have placed the cluster closer to the workings:

- The terrain would have made access difficult for a drill rig.
- A long access road would have been required, adding a large amount of surface disturbance. (The final locations that were agreed upon were next to existing roads.)
- This section was a potential area for new mining under a Lease Modification, therefore it was preferable to locate the well clusters further to the south or west. (Subsequent exploration determined that it was not a viable mining area.)

Past Discussions of POCs

I indicated my understanding of the plan for POCs at the time that TR-26 was approved: after the well clusters were drilled and the collection of data ensued, we planned to wait for a year or two and assess the data before deciding on POCs. Now that data is available, and it is a good time to discuss POCs at the King Coal Mine.

Mr. Beck indicated that his recollection of past discussions was the same as my understanding.

The Path Forward Regarding Specifics of POCs

Mr. Beck indicated that for the alluvium, Well #2 would be a good choice for a POC.

He indicated that for bedrock groundwater, MW-3 would probably be the best choice because of its downgradient location. Per Mr. Beck, MW-4 is cross gradient to the workings in the portion of the King Coal Mine that is regulated by the Division, but this cluster is down gradient from the portion of the King Coal Mine regulated by OSM. It may make sense to use MW-4 as a POC as well as MW-3. He



acknowledged that this requires further discussion, and it may be beneficial to include OSM. He added that there are other clusters (MW-6 and MW-10) that are relevant to the OSM portion of the mine.

I said that using Well #2 for an alluvium POC and MW-3 for a bedrock POC appeared to be a good plan. I reiterated that the Division needs to have internal meetings regarding hydrology at King Coal, including the plan for designating POCs. We may also want to coordinate with OSM. After these discussions, we will contact GCC to have another conference call and decide on a plan forward. GCC and Mr. Beck indicated no concerns with this course of action.

There was no discussion on the standards that should be applied to POCs at King Coal. We all agreed that this portion of the plan could be discussed after issues with the 2018 AHR (and possibly the 2019 AHR) have been discussed between GCC and the Division. I reviewed the 2018 AHR recently and sent GCC a letter with my concerns; it is in the Laserfiche imaging system and dated January 2, 2020.

Items for Internal Division Discussion

- Do we need to coordinate with OSM? What are they doing for POCs related to the OSM permit for the King Coal Mine?
- What criteria should be used for the determination of POC locations?
- What water quality standards should be used to assess compliance at POCs? Should this be based on CDPHE standards such as Regulation 41 for groundwater? This discussion will be informed by the GCC response to my recent AHR review. (Mr. Beck indicated that he will send this to the Division soon.)

