

**Statement of Concern: Subject: DAPP0001717 & EMS No. 001-00481044**  
Location: (W1/2-31-026-03-W5)

Application by Mt Ash Limited Partnership to AEP for approval of a Pit Operation

By Wendell Koning, MSc., PBIol. Limnologist/ Water Quality Specialist

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## **1. Biography**

Mr. C.Wendell Koning, MSc, PBIol is a Limnologist /Water Quality Specialist with 25 years of experience. For the past 22 years, through to retirement (Nov 2020) he worked as a Limnologist working on Southern Alberta lakes and rivers, employed by Alberta Environment and Parks (AEP) in their Calgary office. His main responsibilities included designing water quality monitoring programs and assessing the results. Earlier, he was employed by BC Environment Lands and Parks in Vancouver, as a Fisheries Biologist focussing in particular, on watershed restoration / fish habitat restoration. He thereby has extensive experience in designing and carrying out water quality monitoring studies. As well, he understands the potential impacts from poorly designed industrial activities that can cause negative changes in water quality (turbidity, heavy metals, etc) and water temperature (increased temperatures) and which can negatively impact resident fish species and other aquatic biota.

## **2. The issue of whether the MALP application will result in a negative impact on groundwater.**

Having read the detailed report by Fennell (2021), and Leckie (2022) I find their arguments regarding whether the MALP application (to operate a gravel pit) would or would not impact groundwater are compelling. Both hydrogeological specialists conclude that the MALP proposal will very likely have impacts on the groundwater and downstream Big Hill Springs and Bighill Creek. I find their conclusions to be more supported than the arguments and conclusions (no impact) by the proponent (MALP, and their SLR consultant). Dr Fennell has extensive experience working on hydrogeological issues in Southern Alberta, including the foothills of Alberta. Dr. Leckie, formerly with the Geological Survey of Canada, has written extensively about the geology of this area of the province including specifically Big Hill Springs. Their many years of work experience in this geographical area are likely more extensive and intensive than those of the proponent (MALP) and the mainly out-of-province professional staff of SLR Consulting Canada, used in this proposal.

When knowledge is incomplete, one needs to do ones best to read all sides and then make an informed decision as best as one can. I find the arguments by Fennell (2021) are compelling - grounded by other published, peer reviewed studies, and I greatly respect the extensive years of experience of Dr Leckie. I do not see the same depth of communication from MALP/SLR. For example, one of their main conclusions in their Hydrogeological Assessment report (SLR 2020) is basically that: since there are no streams on the [MALP] property, therefore hydrologic impacts are not possible. I'm uncertain if their observations are correct, nor if their conclusion is correct. I do know, on a map produced by Rocky View County (2021), it shows three streams on the property, the pit working area owned by MALP.

By definition, hydrology includes more than just streams. Hydrology includes wetlands, and in the SLR report, Wetland Assessment and Impact Report, SLR, Aug 2021, in Sec 4.2 they (SLR) identify that they will remove (obliterate) 13 of the 18 wetlands. According to Hayashi et al (2016), ("Hydrology of Prairie Wetlands: Understanding the Integrated Surface-Water and Groundwater Processes"), - *small depressions are collectively the major source of groundwater recharge in the prairies*. The wetlands on the MALP project area (Summit Pit) are part of "hydrology" just as much the streams, that MALP is saying do not exist, but Rocky View County show on a map they are the author of. Dr. Masaki Hayashi, U of Calgary, Geosciences Department, has decades of experience working on hydrogeological studies in the prairies and foothills of southern Alberta. He is well known and well respected at AEP and within local governments (e.g. City of Airdrie) for all his work in monitoring groundwater resources in tributaries of the Bow River – including nearby (one watershed over from the Bighill Creek watershed) in the West Nose Creek watershed. One of his co-authors, Dr. Garth van der Kamp is stationed in Saskatoon – working for decades at Environment Canada.

Again then, I find myself more inclined to accept the input and opinions of Dr's Hayashi and van der Kamp based on their extensive work in southern Alberta, compared to the statements of the key authors of the SLR "Hydrogeological Assessment Report" and the SLR "Wetland Assessment and Impact Report."

And therefore I will follow a more precautionary route and support the arguments and conclusions regarding the likelihood of groundwater impacts from Dr's Fennell and Leckie.

Concerns of impact on groundwater and waterwells in the area, for eg: Big Hill Creek Estates Waterworks, from local landowners, from the users of Big Hill Springs Provincial Park, from the Town of Cochrane, where property values (the tax-base for the Town) will be negatively impacted if the Springs and Creek are significantly impacted need to be addressed before any MALP application to AEP is approved. All are calling for a denial of the MALP application, and that more studies be undertaken before any decisions made. This seems very reasonable to me.

### **3. My area of commenting, my area of expertise**

Below I focus on three parts of the MALP application under the Code of Pits. My comments are directed to the technical reports for the Proponent, Mt Ash Limited Partnership (MALP) (as written by their consultant, SLR Consulting (Canada) Ltd). And again, my area of expertise is limnology/water quality.

**3a. Baseline Monitoring Program.** The SLR Groundwater Monitoring Plan (SLR June 2021) lacks sufficient detail, lacks sufficient "data" upon which to describe a) baseline water quality data in their ground water monitoring wells. The same is true in their baseline surface water quality monitoring - their "baseline" is made of 3 data points, only, - from one site in Big Hill Springs. You cannot describe "baseline" with only three data points, i.e., one sample in 2014, one in 2015 and one in 2019 (in the months of Oct, Aug and July). Besides just 3 data points to "summarize", to describe the water quality conditions in this surface water body - as well there is no seasonal data for spring or winter seasons? Seasonality and annual variability have not been described, cannot be described, summarized with their limited data set. And the 1 sample they report for Oct does not summarize fall water quality. Please see the SLR tech report here, Table A3 on pg 33 pf 143. [SLR Report Template July 2018 \(summitproject.ca/\)](https://summitproject.ca/)

Finally, missing in their baseline water quality assessment: there is no mention that MALP would collect water temperature and dissolved oxygen data. In my experience of 22 years as an AEP Limnologist, I have never seen a provincial monitoring design nor from a municipality (e.g., Calgary) that did not include the very routine, but critical variables of dissolved oxygen and water temperature.

For water quality monitoring, dissolved oxygen (DO) is a critical variable to monitor because the excavation of gravel to 1m above the water table will expose groundwater to oxygen, which could alter the redox condition and trigger unexpected geochemical reactions, as in increase the mobility of heavy metals into the groundwater (and then downstream into the BH Spring and downstream Bighill Creek). Monitoring is especially needed in the spring. This ought to include continuous monitoring of flow rate and temperature, quarterly or monthly measurements of chemical parameters including pH, DO, and electrical conductivity, as well as quarterly sampling and analysis of major ions and important metal species. This is basic data in any water quality monitoring - both for baseline and then especially for operational monitoring. That MALP/SLR (the "Proponent") was unaware of these basic parts of a monitoring program, or was aware and did not include them, are, at the least, puzzling.

Finally, a smaller detail - for surface water quality, see Table A3 - It uses Canadian Water Quality Guidelines (CWQG) Protection for Aquatic Life (PAL) Freshwater Guidelines Updated to September 2019. The proponent is also responsible for applying "Environmental Quality Guidelines for Alberta Surface Waters", March 28, 2018, see: [Environmental Quality Guidelines for Alberta Surface Waters](#). (GOA 2018).

The same comments can be made for groundwater water quality. MALP has, in this case, multiple ground water wells they monitor for water quality (water chemistry and temperature). Note in their table A1 - they have 9 sampling wells for their "Sand and Gravel Monitoring Well Groundwater Quality Results". Of the 9 sites, one site has two water quality samples and the other 8 sites have only one sample. And the dates are all in July, except for 1 site which also has one August date; and two sites with a Nov date. Again - there is insufficient seasonal data, and with only 1-3 water samples per well, there is insufficient data to describe the water quality at one given well; and insufficient to determine annual variations in water quality. In Table A2 - "Paskapoo Formation Residential Well Groundwater Quality Results", there are 4 groundwater well sites, each with only 2 - 3 discrete samples. These too are insufficient as a baseline as per described for table A1.

Completing the baseline assessment: In the same MALP/SLR document, Table 3, pg 20, MALP states they will collect one more water sample for water quality analyses for each groundwater and surface water site - "immediately prior to the pit operation starting". So now this will be their sum total baseline ground and surface water quality data-set to be used to determine if any changes occur (in water chemistry and water temperature) once the pit operation commences. In my opinion there is insufficient data to assess if changes occur.

**3b. Operational Monitoring Program.** The same SLR technical document provides their "operational monitoring plan" (Sec 7.3). See Table 4, pg 21. During the open pit mining at the site - their water quality monitoring program will consist of of "1 water sample at each site annually". One sample, only, per year. The proponent then will use this data to "assess trends". But to do so, the proponent requires data, field data, empirical data. The proponent states that after they have collected sufficient water quality data - then they will conduct statistical analyses to determine if there is any trend, any change in water quality (i.e., the water chemistry, water temperature) . To do "trend assessments", sufficient data is required. Sufficient data starts at 5-

10-15 data points since the Proponent identifies in Sec 8.2 that they would use more rigorous statistical tests (they quote using Mann-Kendall) for determine trends, the more data, the more accurate the analysis, the less data, the less accurate. To collect this many data points, based on their operational monitoring plan, would therefore require waiting 5-10-15 yrs before one could assess trends - and if then a trend is detected and found to be negative, it may be too late to mitigate the damage, the result being permanent damage to the BH Spring, Bighill Creek and instream biota, currently diverse and in good health (See data reports on the Bighill Creek Preservation Society website, their reports, they commissioned, freely available for all to use - including to inform the technical reports of the proponent (MALP/SLR).

### **3c. Cummulative Effects Assessment (CEA).**

Please refer to another MALP report (by SLR), namely the Biophysical Inventory Assessment (BIA) report, SLR Jan 2020

[C2261 MALP Summit Biophysical-Impact-Assessment-Report SLR Jan-2020.pdf \(summitproject.ca\)](http://summitproject.ca) The BIA report.

See BIA Section 7.0 CUMULATIVE EFFECTS ASSESSMENT. In this section, 1 page in length, only, the proponent addresses cumulative effects from both the proposed application as well as all other activities (ranching, oil and gas, other open pit gravel mines) current and reasonably, with strong potential to occur. MALP/SLR carried out this assessment without providing their investigative process, without any numerical data on ranching, farm animals, grazing, and oil and gas facilities - these were only mentioned, in three sentences in this section. MALP/SLR do mention the extent of other pits in the area - either in operation (Hillside) or at some stage in the application process. MALP/SLR mentions four gravel mining operators in the Bighill Creek watershed, but they omitted the Burnco property immediately adjacent to the Big Hill Springs Prov Park. One item that is puzzling: Burnco owns this land - the largest parcel in size of all the 5 pit mining operators, and so, why did MALP/SLR omit the largest gravel / aggregate mining company? Surely if they own the land, there is a very reasonable expectation they will apply to operate a pit (gravel mine) on their land. MALP/SLRS then concluded "as long as all parties followed the GOA, Government of Alberta Code of Practice for Pits (GOA 2004) and associated GOA documents - these will be used "to avoid or minimize environmental effects on biophysical resources". Just this sentence was provided, no details provided, nothing explaining / supporting this conclusion.

### **4. In summary / my conclusions / my recommendation to AEP Approvals**

I am concerned that the processes, the decision making, the conclusions I found within the MALP /SLR a) baseline monitoring, b) operational monitoring, and c) cumulative effects assessment may be similar to the processes MALP used to conclude: "there will be no significant negative impacts on groundwater and surface water from their proposed open pit gravel mining operation".

Because of my concerns, I recommend to AEP Approvals that the application for pit operation by MALP be **denied**, and that a moratorium be placed on their current application and on any other pit operations in the Bighill Creek watershed, until comprehensive, multi-year field based studies are carried out by a neutral third party to either confirm or deny pit operations in the Bighill Creek watershed / groundwater-shed. These should also include a comprehensive cumulative effects assessment.

Yours sincerely

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NOTE, DIRECTLY AFFECTED: I am a user of the Big Hill Springs Provincial Park and an owner of the park via my taxes. I have a financial stake as taxpayer, in the successful protection and management of the Park.

### References cited

NOTE: all references are available on the website of the Bighill Creek Preservation Society.  
<https://bighillcreek.ca/>

Fennel, Jon. 2021. Mountain Ash Limited Partnership Summit Gravel Pit, Review of hydrogeology, geochemistry, fish and aquatics, and climate change Prepared by: Dr. Jon Fennel, M.Sc., Ph.D., P.Geol. Hydrogeologist and Geochemist Water Security | Climate Resiliency. On behalf of: Friends of Big Hill Springs Provincial Park and Bighill Creek Preservation Society. For: Rocky View County Council Re: Bylaw C-8051-2020 January 2021.

GOA, Government of Alberta. 2004. Code of Practice for Pits. See:  
<https://open.alberta.ca/publications/pits>  
[https://www.qp.alberta.ca/1266.cfm?page=PITS.cfm&leg\\_type=Codes&isbncln=9780779765560](https://www.qp.alberta.ca/1266.cfm?page=PITS.cfm&leg_type=Codes&isbncln=9780779765560)

Hayashi, Masaki,, Garth van der Kamp and Donald O. Rosenberry. 2016 . Hydrology of Prairie Wetlands: Understanding the Integrated Surface-Water and Groundwater Processes. In: Wetlands (2016) 36 (Suppl 2):S237–S254.

Leckie, Dale (2022). Statement of Concern, re : DAPP0001717 & EMS No. 001-00481044.

Rocky View County (October 2021) Road Allowance map showing surface watercourses in the MALP property identified for the pit application to AEP.