EPA is not convinced that the well is in the best location and how difficult access is in other locations not immediately adjacent to the existing wells. Thus, it would seem important that if contamination is not found at this location, the well could be stressed (i.e. pumped) over time to see if contamination not directly adjacent to the well exists along strike more towards the pumping influence of the supply well (and in the direction of well MW-5).

EPA's comments are provide in green (I hope!)

Please provide a response to the comments below regarding the Work Plan for Installation of Deep Bedrock Monitoring, before mobilizing to drill.

2.1. It is unclear as to why the well is proposed to be installed adjacent to existing well MW-8. Please provide a rationale. In the July 11 submittal it was to be installed as a pair with MW-5.

Response: ERM moved the location of the new well from MW-5 to MW-8 because of access concerns. It was our opinion that the new well could not be safely installed adjacent to MW-5.

Response: It is not clear that the proposed location will encounter contamination influenced by flow along dip and strike as affected by the pumping of the Dublin water supply well and indicated by the configuration of the known plume. However, it is my understanding that ERM feels that this location is more suitable than one located nearer to well MW-8.

Section 2.2. It is unclear as to why the well will be allowed to equilibrate for at least 36 hours after drilling before conducting geophysical testing. What will be the maximum time allowable prior to testing?

Response: The well will be allowed to equilibrate for 36 hours to allow for the disturbed fine grained material within groundwater to settle within the well, thereby increasing the probability of success for the geophysical survey and televIEWer surveys.

Response: It is my experience that the only tools which may be impacted are the borehole videologger and the optical televIEWer. The other geophysical tools and acoustic televIEWer would not be impacted. It is recommended that the surveys are conducted as soon as practicable.

2.3. Heat pulse flowmeter should be conducted under both ambient and pumped conditions.

Response: ERM does not see the value of conducting the heat pulse flowmeter under pumped conditions. The new well will only be an observation well and will not be stressed as part its function. Thus, the most appropriate results will be those obtained under static or ambient conditions. The data gained by running the heat pulse flow meter under stress conditions will not provide any added benefit for the added costs incurred.

Response: As noted by the USGS in multiple publications: "In fractured-rock investigations it is important to conduct flowmeter logging under ambient and stressed conditions. The composite head in an open hole is the sum of the transmissivity-weighted heads of the individual fracture zones and is dominated by the head of the most transmissive zone. Flowmeter logging conducted under pumping conditions can be used to identify transmissive fracture zones with similar ambient heads that would not be identified without stressing the aquifer". (http://water.usgs.gov/ogw/bgas/flowmeter/).

2.4. The use of the FLUte FACT liner is innovative and should be used in tandem with traditional packer testing to verify appropriate use under site conditions. With the use of the FACT, it is not possible to purge
the sample adequately to remove water impacted by drilling from specific fractures/fracture intervals.

Response: Use of the Water FLUte and packers is redundant. However, consideration will be given for conducting a single round of packer testing for comparative purposes. The well will be properly developed after installation to remove water disturbed during drilling, and the FLUte water system can be purged prior to sample collection.

Response: Use of the FLUte and packer test intervals is not redundant at collecting samples from each hydraulically active fracture or fracture zone in the open borehole to determine if and where individual monitoring ports should be located and to vertically profile the chemistry of the borehole. Specific use of the FELT, as previously noted, is an innovative technology which would need to be evaluated in concert with the standard packer testing and sample collection to ensure that it is appropriate for site conditions.

and or the construction of the FLUte well and monitoring port locations should be made by consensus with EPA. Under no circumstances should the liner/FLUte well be removed after sampling in order to prevent intraborehole flow while the well remains as an open borehole.

Response: Comment noted. Please note, the monitoring wells at the site are open hole and are sampled as composite samples or using packers to isolate desired zones. Using the FLUte liner, after groundwater samples are collected, the FLUte Water system is deflated but remains in the well.

Response: Please note that it is inappropriate to have open hole wells which monitor more than one fracture zone in bedrock monitoring wells. EPA has noted this on multiple occasions and does not recommend the continued use of open holes for monitoring on or off the property site. The FLUte system should continue to be inflated to prevent intraborehole flow.

Please ensure that all materials associated with the FLUte liners are determined to be free of ancillary contaminants, such as toluene and arsenic.

Response: Comment noted, ERM will confirm the construction materials and provide the data from the vendor to EPA prior to installation of the FLUte liner.

PADEP also provided a lessons learned:

A FLUte was used by PADEP in a well in one well at a Site, the upward flow of groundwater had pushed the Flute nearly out of the well. Bentonite grout had to be pumped inside the liner to hold the FLUte in place.

Response: Comment noted. Please provide more information on this installation if possible so ERM can research and discuss this with FLUte. This would not comport with our experience in installing FLUtes as the FLUte is filled with water and it would appear that the head within the FLUte would act against any upward gradient observed in the borehole.

Please provide a schedule as soon as possible so EPA can arrange oversight.

Response: Our current schedule entails obtaining access to the target property (Meyers' Lawnmower Shop) by not later than 21 December, and then to clear the proposed drilling site via subsurface clearance techniques (underground utility clearance equipment and use of an air knife) prior to the end of the calendar year. Due to ERM's internal health & safety protocols and subcontractor approval process (among other factors), we are now proposing to perform drilling activities for the well installation during the first or second week of January, weather permitting. Downhole testing and chemical sampling of the new well are proposed to occur later in January, weather permitting, or near the end of the 1Q13 when weather conditions allow. We will certainly apprise you in advance of any changes to this schedule, or as the scheduling becomes more definitive.

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