TECHNICAL MEMORANDUM

DATE June 30, 2023 **Project No.** 21456909

TO Theyonas Manoharan, Project Manager
Geranium

FROM Greg Padusenko, John Piersol **EMAIL gregory.padusenko@wsp.com**

WATER SUPPLY INVESTIGATION SUMMARY – PROPOSED DEVELOPMENT, FERGUS GOLF CLUB, 8243 AND 8282 WELLINGTON ROAD 19, FERGUS, ONTARIO

WSP Canada Inc. (formerly Golder Associates Ltd.) was retained by 883890 Ontario Limited c/o Fergus Development Inc. to carry out a water supply exploration investigation for a proposed residential development at 8243 and 8282 Wellington Road 19, the Township of Centre Wellington, Ontario. The purpose of the investigation was to assess the feasibility of a water supply for the proposed subdivision. The findings of the investigation are included in the Water Supply Investigation Report (Golder, 2022) with key findings summarised in this memorandum.

As part of the exploration program a new supply test well (PW21-1) was constructed in the northwest part of the golf course in May 2021. The well is completed to a depth of approximately 91.4 m within the bedrock aquifer. The bedrock is overlain by approximately 29.9 m of sandy to gravelly silt till that acts as a protective layer. In addition, three monitoring wells were completed in the bedrock aquifer to monitor water levels along the boundary of the property and to determine the influence on water levels from pumping PW21-1.

In order to confirm the water supply, a pumping test of 72 hours duration was completed from August 31, 2021 to September 3, 2021 at a rate of 8.8 L/s. The pumping test was conducted at a higher rate than what is estimated to be required to supply the new development. The average day water taking is estimated to be 128 m^3/d (1.48 L/s – 17% of tested rate) and the maximum day water taking is estimated to be 435 m^3/d (5.03 L/s – 57% of tested rate). When pumping at 8.8 L/s the largest amount of drawdown observed in the monitoring wells was 2.8 m. At this higher pumping rate, the drawdown cone in the bedrock is estimated to extend approximately 1 km from PW21-1 with approximately 0.4 m of drawdown estimated at that distance.

When determining the feasibility of the water supply, the aquifer presence, groundwater quality, groundwater quantity, impacts to other users, impacts to the environment and source water protection were assessed.

It is inferred that the bedrock underlying the site is part of a regional bedrock aquifer that is the target aquifer for the water supply well. PW21-1 has demonstrated the ability to yield the required average day and maximum day demands for the proposed development based on the pumping test conducted.

With respect to interference with private wells in the area, it should be noted that some of the private wells are completed in the bedrock aquifer while some of the private wells are completed in the overburden. The interference with the bedrock private wells from pumping PW21-1 is not expected to impact the operation of the wells, with less than 1 m of additional drawdown estimated in the closest private wells (the drawdown will

decrease with distance away from PW21-1). The available drawdown (to the top of the bedrock) at PW21-1 is approximately 20 m. The available drawdown in the bedrock private wells would be similar. An additional drawdown of 1 m at the closest private well would account for 5% of the available drawdown and not interfere with the existing operation of the wells. Interference with the overburden private wells from pumping PW21-1 is not anticipated as PW21-1 draws water from the deep bedrock aquifer separated from the shallow overburden aquifer. There is no identified interaction between shallow water wells and the deep bedrock wells on the site. In addition, there are no anticipated impacts to surface water features.

The water taking from PW21-1 will require a Permit to Take Water (PTTW) from the Ministry of the Environment Conservation and Parks. The PTTW will limit how much water can be taken from the well. A monitoring program will be included in the PTTW which may require measuring water levels in the monitoring wells. Tracking the water levels in the monitoring wells will act as an early warning system for potential interference with the bedrock private wells. In addition, the PTTW will have conditions stipulating that if permanent interference with private wells is caused by the water taking then the permit holder shall restore the water takings of those permanently affected. Prior to construction, precondition well surveys will be completed for a radius of approximately 1 km from PW21-1(radius of influence at the higher pumping rate of 8.8 L/s).

With respect to the municipal water supply, the site is located in a low vulnerability zone where no significant threats to the municipal wells are present. PW21-1 is located outside of the Township water quantity protection zone and does not interfere with the municipal water supply.

PW21-1 is not considered groundwater under the direct influence of surface water (GUDI) and the water quality in the bedrock aquifer meets the Ontario Drinking Water Quality Standards with the exception of hardness and total dissolved solids, which can be treated.

The developer will be responsible for the well operation and monitoring during the first two years of operation and then the system will be turned over to the Condo Corporation. At that time the system will be operated by a licensed operator.

In summary, PW21-1 can provide the water supply required for the proposed development with no unacceptable impacts to surrounding wells and the environment.

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