GEMTEC Consulting Engineers and Scientists Limited
1100 Bennett Rd., Unit 4
Bowmanville, ON, Canada
L1C 0Y7

gta@gemtec.ca
www.gemtec.ca

July 2, 2026

File: 101987.017(7) – Rev0

Fergus Developments Inc.
3190 Steeles Avenue East, Suite 300
Markham, Ontario
L3R 1G9

Attn: Theyonas Manoharan, P.Eng., Senior Project Manager, Land Development

Re: Updated Water Balance Addendum – Hydrogeological Investigation Report
Fergus Golf Course Redevelopment, Fergus, Ontario

Fergus Developments Inc. has retained GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) to provide an update to the water balance assessment that was initially completed for the previous version of the draft Site Plan for the proposed Fergus residential development on 8243 Wellington Road 19 (the Site). The initial water balance assessment was presented in the hydrogeological assessment titled "*Updated Hydrogeological Investigation Report, Fergus Golf Course Redevelopment, Residential Development, Fergus, Ontario",* dated November 11, 2024, completed by GEMTEC (GEMTEC, 2024).

This letter provides an addendum to the above referenced report (GEMTEC, 2024), updating the water balance assessment to reflect changes to the draft plan of subdivision (provided in Attachment B).

This Report is subject to the Conditions and Limitations of This Report, which follows the text of the report, and are considered an integral part of the report (Attachment A). The factual data, interpretations and recommendations contained in this report pertain to a specific project as described in the report and are not applicable to any other project or site location. If the project is modified in concept, location or elevation, GEMTEC should be given an opportunity to confirm that the recommendations in this report are still valid.

UPDATED WATER BALANCE ASSESSMENT

The post-development and mitigated post-development water balance assessments are updated to reflect changes to the draft plan of subdivision, which now include 446 single detached units, a storm water management (SWM) pond, open space, wetlands, parks, and a sanitary pumping station. The updated water balance assessment follows the same methodology as presented in GEMTEC (2024).

Estimates of land use areas including open space, roads and roof area for the sanitary pumping station were estimated from drawings provided by the client (Development Concept provided in

Attachment B and Typical Lot Impervious Coverage provided in Attachment C). Each lot was assumed to be 40% impervious with an average roof area of 242 m^2 and driveway area of 65 m^2.

As part of the post-development design, the grade will be raised as much as 3.71 m, in the northwestern part of the Site.

1.1 Results

A portion of the Site, is located within a WHPA-Q. As per the Grand River Source Protection Plan for the County of Wellington, Policy WC-MC-23.5, to ensure that a Recharge Reducing Activity does not become a significant drinking water threat and to maintain pre-development recharge to the greatest extent feasible, a water balance assessment is required for new developments.

As such, a water budget for the pre-development, post-development, and mitigated post-development was carried out for the entire Site as well as the WHPA-Q area within a portion of the Site.

The pre-development and post-development water balance results and inputs including the areal estimates each land use, the WHC applied to each soil group, and infiltrations factors and sub-factors for each land cover combination applied are summarized in Table I.7 to I.11 of Attachment D.

1.1.1 Pre-Development

The average annual pre-development water balance assessment for the Site and the portion of the Site within the WHPA-Q is summarized in Table 1.

Table 1.1 – Average Annual Pre-Development Water Balance Results

	Hydrologic Cycle Components			
	Precipitation (P)	Evapotranspiration (ET)	Infiltration (I)	Runoff (R)
SE Site	382,774	223,728	86,461	72,585
WHPA-Q Area	38,315	23,006	8,143	7,166

1.1.2 Post-Development

The average annual post-development water balance assessment for the SE Site and the portion of the site within the WHPA-Q is summarized in Table 1.2.

Table 1.2 – Average Annual Post-Development Water Balance Results

	Hydrologic Cycle Components			
	Precipitation (P)	Evapotranspiration (ET)	Infiltration (I)	Runoff (R)
SE Site	382,774	146,114	45,038	191,622
WHPA-Q Area	38,315	12,726	4,844	20,745

As presented in the water balance assessment summaries (Table 1.1 and Table 1.2) the proposed development without mitigation is estimated to result in an increase in runoff of 164% (from 72,585 m^3/year to 191,622 m^3/year) on annual basis across the entire site compared to the pre-development condition, and a decrease in infiltration across the entire site of 48% (from 86,461 m^3/year to 45,038 m^3/year) on annual basis.

Similarly, the portion within the WHPA-Q post-development is expected to have increase in runoff of 189% (from 7,166 to 20,745 m^3/year) and infiltration is expected to decrease by 41 % (from 8,143 to 4,844 m^3/year remain compared to pre-development conditions.

1.1.3 Mitigated Post-Development

As presented above, without any mitigation, the volume of infiltration post-development is expected to decrease and the volume of runoff post-development is expected to increase relative to the pre-development condition. Recharge at the Site is expected to contribute to maintaining a seasonally elevated water table which is understood to support the central wetland area (WSP, 2023). Furthermore, as a portion of the Site is within the WHPA-Q, this would be required to maintain pre-development recharge to the greatest extent feasible within the WHPA Q.

Mitigation of the decrease to infiltration is proposed by constructing low impact development features (LID) that are designed to increase infiltration by diverting water that would otherwise runoff. A detailed LID plan for the revised draft plan will be included as part of the detailed design, once design of LID features has been advanced. The infiltration deficit will be addressed through the provision of appropriately sized LID measures, such as infiltration galleries and downspout disconnections which will be designed to provide the infiltration volume required to achieve the infiltration target.

1.2 Concluding Remarks

The water balance assessment was updated based on the new Concept Plan with assumptions applied. The LID framework and design details will be finalized during detailed design.

The mitigated post-development water balance will be completed as part of the detailed design, once features have been designed. Mitigation measures such as lot-level infiltration galleries, and

downspout disconnections will be implemented to promote recharge. It is recommended that the LID designer explores additional opportunities such as increased topsoil depths to further enhance recharge.

A review of the LID plans and in-situ infiltration rate testing is recommended to support detailed design of LID features. The infiltration rates of native soils and imported fill materials in areas where the grade is raised should be confirmed via field testing.

CLOSURE

We trust that this submission meets your current requirements. Please contact the undersigned with any questions or to discuss.

Regards,

GEMTEC Consulting Engineers and Scientists Limited

Hakyung Choi, M.Sc.
Geoscientist-in-Training

Kimberly Gilder, P.Geo.
Senior Hydrogeologist

CC/KG/AP/sv

Attachment A: Conditions and Limitations of This Report
Attachment B: Development Concept Plan, prepared by GSP Group
Attachment C: Typical Conceptual Lot Layout Plan, prepared by R.J. Burnside
Attachment D: Revised Tables I.1 to I.11 – Water Balance Assumptions and Calculation Summary

N:\Projects\101900\101987.017\Deliverables\Reports\7. Updated HIR\Updated Water Balance Addendum - 23-June-2026\101987.017_LTR_Updated Water Balance Addendum_Fergus_2026-07-02_Rev0.docx

ATTACHMENT A

Conditions and Limitations of This Report

CONDITIONS AND LIMITATIONS OF THIS REPORT

1. **Standard of Care:** GEMTEC has prepared this report in a manner consistent with generally accepted engineering or environmental consulting practice in the jurisdiction in which the services are provided at the time of the report. No other warranty, expressed or implied is made.
2. **Copyright:** The contents of this report are subject to copyright owned by GEMTEC, save to the extent that copyright has been legally assigned by us to another party or is used by GEMTEC under license. To the extent that GEMTEC owns the copyright in this report, it may not be copied without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to the Client in confidence and must not be disclosed or copied to third parties without the prior written agreement of GEMTEC. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests.
3. **Complete Report:** This report is of a summary nature and is not intended to stand alone without reference to the instructions given to GEMTEC by the Client, communications between GEMTEC and the Client and to any other reports prepared by GEMTEC for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. GEMTEC cannot be responsible for use of portions of the report without reference to the entire report.
4. **Basis of Report:** This Report has been prepared for the specific site, development, design objectives and purposes that were described to GEMTEC by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document, subject to the limitations provided herein, are only valid to the extent that this report expressly addresses the proposed development, design objectives and purposes. Any change of site conditions, purpose or development plans may alter the validity of the report and GEMTEC cannot be responsible for use of this report, or portions thereof, unless GEMTEC is requested to review any changes and, if necessary, revise the report.
5. **Time Dependence:** If the proposed project is not undertaken by the Client within 18 months following the issuance of this report, or within the timeframe understood by GEMTEC to be contemplated by the Client, the guidance and recommendations within the report should not be considered valid unless reviewed and amended or validated by GEMTEC in writing.
6. **Use of This Report:** The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without GEMTEC's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, GEMTEC may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process.

   Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.
7. **No Legal Representations:** GEMTEC makes no representations whatsoever concerning the legal significance of its findings, or as to other legal matters touched on in this report, including but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.
8. **Decrease in Property Value:** GEMTEC shall not be responsible for any decrease, real or perceived, of the property or site's value or failure to complete a transaction, as a consequence of the information contained in this report.
9. **Reliance on Provided Information:** The evaluation and conclusions contained in this report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations. information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of misstatements, omissions,

misrepresentations. or fraudulent acts of the Client or other persons providing information relied on by us. We are entitled to rely on such representations, information and instructions and are not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

10. **Investigation Limitations:** Site investigation programs are a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions but even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions.

    The data derived from the site investigation program and subsequent laboratory testing are interpreted by trained personnel and extrapolated across the site to form an inferred geological representation and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Conditions between and beyond the borehole/test hole locations may differ from those encountered at the borehole/test hole locations and the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. Accordingly, GEMTEC does not warrant or guarantee the exactness of of the subsurface descriptions.

    Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

    In addition, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

11. **Sample Disposal:** GEMTEC will dispose of all uncontaminated soil and/or rock samples 60 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fill materials or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.

12. **Follow-Up and Construction Services:** All details of the design were not known at the time of submission of GEMTEC's report. GEMTEC should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of GEMTEC's report.

    During construction, GEMTEC should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of GEMTEC's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in GEMTEC's report. Adequate field review, observation and testing during construction are necessary for GEMTEC to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, GEMTEC's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

13. **Changed Conditions:** Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that GEMTEC be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that GEMTEC be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

14. **Drainage:** Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. GEMTEC takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

ATTACHMENT B

Development Concept Plan, prepared by GSP Group

Development Concept

Fergus Golf Course Redevelopment

Site Area: 39.7ha.
Lots: 446

- 52' - 19 Lots
- 45' - 116 Lots
- 38' - 183 Lots
- 32' - 128 Lots

Drainage Easement

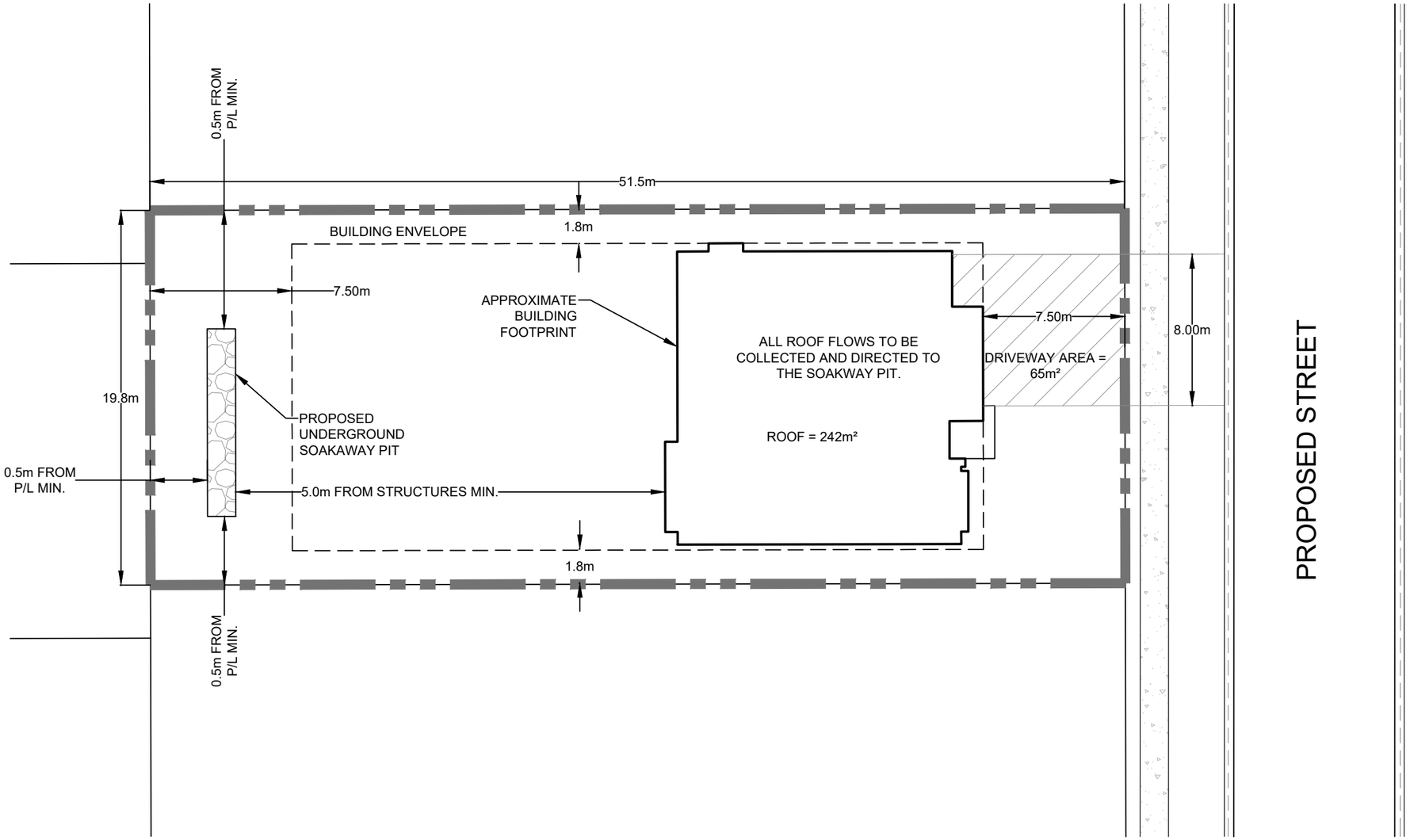
NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of units, floor area and parking supply are approximate and subject to more detailed design as well as municipal planning approvals.

June 1, 2026 | Project No.: 24128 | Drawn By: EF/MN

GSP group

ATTACHMENT C

Typical Conceptual Lot Layout Plan, prepared by R.J. Burnside



SITE STATISTICS:

AVERAGE LOT AREA +/- 1021m²

IMPERVIOUS AREA = 307m²
PERVIOUS AREA = 741m²

% IMPERVIOUS USED IN SWM MODELING = 40%

BURNSIDE

Client

FERGUS DEVELOPMENT INC.

Figure Title

FERGUS GOLF COURSE REDEVELOPMENT

TYPICAL LOT IMPERVIOUS COVERAGE

Drawn	Checked	Date	Figure No.
Z.J.	M.B.	25/10/01	6
Scale		Project No.	
1:250		052719.3000	

ATTACHMENT D

Revised Tables I.1 to I.11
Water Balance Assumptions and Calculation Summary

Table I.1- Environment Canada Precipitation, Surplus Data Fergus Shand Dam, Ontario
Hydrogeological Investigation
Fergus, Ontario

Fergus Shand Dam Water Budget Means for the period 1965-2022 6142400

Water Holding Capacity	75	mm
Heat Index	34.97	
Lower Zone	45	mm
A	1.054	
Date Range	1965	2022

Date	Temperature (°C)	Precipitation (mm)	Rain (mm)	Melt (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm)	Deficit (mm)	Surplus (mm)	Snow (mm)	Soil (mm)	Accumulated Precipitation (mm)
January	-7.7	74	20	19	1	1	0	38	69	75	324
February	-7.2	61	18	25	1	1	0	42	87	75	384
March	-2.1	66	38	74	7	7	0	104	41	75	450
April	5.2	79	72	48	30	30	0	90	0	75	529
May	12.3	80	80	0	76	76	0	18	0	61	610
June	17.4	93	93	0	110	103	-7	11	0	40	704
July	19.9	82	82	0	128	103	-25	2	0	17	786
August	19.1	89	89	0	114	88	-26	4	0	15	875
September	15	88	88	0	77	67	-10	7	0	28	963
October	8.4	84	84	0	38	37	-1	20	0	55	83
November	2	86	74	8	12	12	0	53	4	72	168
December	-4.1	79	33	17	2	2	0	45	33	75	247
Average	6.4										
Total		961	771	191	596	527	-69	434			

Entered by: CC
Checked by: AP

Client: Fergus Development Inc.
Project Number: 101987.017
July 2026

Table I.2- Environment Canada Precipitation, Surplus Data Fergus Shand Dam, Ontario
Hydrogeological Investigation
Fergus, Ontario

Fergus Shand Dam Water Budget Means for the period 1965-2022 6142400

Water Holding Capacity	100	mm
Heat Index	34.97	
Lower Zone	60	mm
A	1.054	
Date Range	1965	2022

Date	Temperature (°C)	Precipitation (mm)	Rain (mm)	Melt (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm)	Deficit (mm)	Surplus (mm)	Snow (mm)	Soil (mm)	Accumulated Precipitation (mm)
January	-7.7	74	20	19	1	1	0	37	69	100	324
February	-7.2	61	18	25	1	1	0	42	87	100	384
March	-2.1	66	38	74	7	7	0	104	41	100	450
April	5.2	79	72	48	30	30	0	90	0	100	529
May	12.3	80	80	0	76	76	0	18	0	86	610
June	17.4	93	93	0	110	107	-3	11	0	61	704
July	19.9	82	82	0	128	112	-16	2	0	29	786
August	19.1	89	89	0	114	91	-23	4	0	23	875
September	15	88	88	0	77	68	-9	7	0	37	963
October	8.4	84	84	0	38	37	-1	16	0	68	83
November	2	86	74	8	12	12	0	45	4	94	168
December	-4.1	79	33	17	2	2	0	42	33	99	247
Average	6.4										
Total		961	771	191	596	544	-52	418			

Entered by: CC
Checked by: AP

Client: Fergus Development Inc.
Project Number: 101987.017
July 2026

Table I.3 - Environment Canada Precipitation, Surplus Data Fergus Shand Dam, Ontario
Hydrogeological Investigation
Fergus, Ontario

Fergus Shand Dam Water Budget Means for the period 1965-2022 6142400

Water Holding Capacity	125	mm
Heat Index	34.97	
Lower Zone	75	mm
A	1.054	
Date Range	1965	2022

Date	Temperature (°C)	Precipitation (mm)	Rain (mm)	Melt (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm)	Deficit (mm)	Surplus (mm)	Snow (mm)	Soil (mm)	Accumulated Precipitation (mm)
January	-7.7	74	20	19	1	1	0	36	69	124	324
February	-7.2	61	18	25	1	1	0	42	87	125	384
March	-2.1	66	38	74	7	7	0	104	41	125	450
April	5.2	79	72	48	30	30	0	90	0	125	529
May	12.3	80	80	0	76	76	0	18	0	111	610
June	17.4	93	93	0	110	109	-1	11	0	84	704
July	19.9	82	82	0	128	118	-10	2	0	46	786
August	19.1	89	89	0	114	96	-18	4	0	35	875
September	15	88	88	0	77	68	-9	7	0	48	963
October	8.4	84	84	0	38	38	-1	13	0	82	83
November	2	86	74	8	12	12	0	37	4	115	168
December	-4.1	79	33	17	2	2	0	40	33	123	247
Average	6.4										
Total		961	771	191	596	558	-39	404			

Entered by: CC
Checked by: AP

Client: Fergus Development Inc.
Project Number: 101987.017
July 2026

Table I.4 - Environment Canada Precipitation, Surplus Data Fergus Shand Dam, Ontario
Hydrogeological Investigation
Fergus, Ontario

Fergus Shand Dam Water Budget Means for the period 1965-2022 6142400

Water Holding Capacity	150	mm
Heat Index	34.97	
Lower Zone	90	mm
A	1.054	
Date Range	1965	2022

Date	Temperature (°C)	Precipitation (mm)	Rain (mm)	Melt (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm)	Deficit (mm)	Surplus (mm)	Snow (mm)	Soil (mm)	Accumulated Precipitation (mm)
January	-7.7	74	20	19	1	1	0	34	69	148	324
February	-7.2	61	18	25	1	1	0	41	87	149	384
March	-2.1	66	38	74	7	7	0	103	41	150	450
April	5.2	79	72	48	30	30	0	90	0	150	529
May	12.3	80	80	0	76	76	0	18	0	136	610
June	17.4	93	93	0	110	110	0	11	0	108	704
July	19.9	82	82	0	128	122	-6	2	0	66	786
August	19.1	89	89	0	114	100	-14	4	0	51	875
September	15	88	88	0	77	69	-8	7	0	64	963
October	8.4	84	84	0	38	38	-1	12	0	98	83
November	2	86	74	8	12	12	0	34	4	135	168
December	-4.1	79	33	17	2	2	0	38	33	145	247
Average	6.4										
Total		961	771	191	596	568	-29	394			

Entered by: CC
Checked by: AP

Client: Fergus Development Inc.
Project Number: 101987.017
July 2026

Table I.5 - Environment Canada Precipitation, Surplus Data Fergus Shand Dam, Ontario
Hydrogeological Investigation
Fergus, Ontario

Fergus Shand Dam Water Budget Means for the period 1965-2022 6142400

Water Holding Capacity	250	mm
Heat Index	34.97	
Lower Zone	150	mm
A	1.054	
Date Range	1965	2022

Date	Temperature (°C)	Precipitation (mm)	Rain (mm)	Melt (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm)	Deficit (mm)	Surplus (mm)	Snow (mm)	Soil (mm)	Accumulated Precipitation (mm)
January	-7.7	74	20	19	1	1	0	29	69	244	324
February	-7.2	61	18	25	1	1	0	39	87	246	384
March	-2.1	66	38	74	7	7	0	102	41	248	450
April	5.2	79	72	48	30	30	0	88	0	250	529
May	12.3	80	80	0	76	76	0	18	0	236	610
June	17.4	93	93	0	110	110	0	11	0	208	704
July	19.9	82	82	0	128	127	-1	2	0	161	786
August	19.1	89	89	0	114	110	-4	4	0	136	875
September	15	88	88	0	77	73	-4	7	0	145	963
October	8.4	84	84	0	38	38	0	11	0	180	83
November	2	86	74	8	12	12	0	30	4	220	168
December	-4.1	79	33	17	2	2	0	33	33	235	247
Average	6.4										
Total		961	771	191	596	587	-9	374			

Entered by: CC
Checked by: AP

Client: Fergus Development Inc.
Project Number: 101987.017
July 2026

Table I.6 - Environment Canada Precipitation, Surplus Data Fergus Shand Dam, Ontario
Hydrogeological Investigation
Fergus, Ontario

Fergus Shand Dam Water Budget Means for the period 1965-2022 6142400

Water Holding Capacity	300	mm
Heat Index	34.97	
Lower Zone	180	mm
A	1.054	
Date Range	1965	2022

Date	Temperature (°C)	Precipitation (mm)	Rain (mm)	Melt (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm)	Deficit (mm)	Surplus (mm)	Snow (mm)	Soil (mm)	Accumulated Precipitation (mm)
January	-7.7	74	20	19	1	1	0	27	69	292	324
February	-7.2	61	18	25	1	1	0	39	87	295	384
March	-2.1	66	38	74	7	7	0	102	41	298	450
April	5.2	79	72	48	30	30	0	88	0	300	529
May	12.3	80	80	0	76	76	0	18	0	286	610
June	17.4	93	93	0	110	110	0	11	0	258	704
July	19.9	82	82	0	128	128	0	2	0	210	786
August	19.1	89	89	0	114	112	-2	4	0	184	875
September	15	88	88	0	77	74	-3	7	0	191	963
October	8.4	84	84	0	38	38	0	11	0	227	83
November	2	86	74	8	12	12	0	30	4	267	168
December	-4.1	79	33	17	2	2	0	33	33	282	247
Average	6.4										
Total		961	771	191	596	591	-5	372			

Entered by: CC
Checked by: AP

Client: Fergus Development Inc.
Project Number: 101987.017
July 2026

Table I.7 - Environment Canada Precipitation, Surplus Data Fergus Shand Dam, Ontario
Hydrogeological Investigation
Fergus, Ontario

Fergus Shand Dam Water Budget Means for the period 1965-2022 6142400

Water Holding Capacity	400	mm
Heat Index	34.97	
Lower Zone	240	mm
A	1.054	
Date Range	1965	2022

Date	Temperature (°C)	Precipitation (mm)	Rain (mm)	Melt (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm)	Deficit (mm)	Surplus (mm)	Snow (mm)	Soil (mm)	Accumulated Precipitation (mm)
January	-7.7	74	20	19	1	1	0	26	69	390	324
February	-7.2	61	18	25	1	1	0	39	87	393	384
March	-2.1	66	38	74	7	7	0	101	41	396	450
April	5.2	79	72	48	30	30	0	86	0	400	529
May	12.3	80	80	0	76	76	0	18	0	386	610
June	17.4	93	93	0	110	110	0	11	0	358	704
July	19.9	82	82	0	128	128	0	2	0	310	786
August	19.1	89	89	0	114	113	-1	4	0	282	875
September	15	88	88	0	77	76	-1	7	0	287	963
October	8.4	84	84	0	38	38	0	11	0	323	83
November	2	86	74	8	12	12	0	29	4	364	168
December	-4.1	79	33	17	2	2	0	32	33	379	247
Average	6.4										
Total		961	771	191	596	594	-2	366			

Entered by: CC
Checked by: AP

Client: Fergus Development Inc.
Project Number: 101987.017
July 2026

Table I.8: Pre-Development Water Budget (SE Site), Fergus Golf Course Redevelopment, Residential Development, Fergus, Ontario

Description	Units	House	Entrance Roadways	Ponds	Wetland	Forested Area		Lawn			Undeveloped Area (Pasture and Shrubs)		TOTALS	Notes
Soil Type	-	n/a	n/a	n/a	n/a	Sand Loam	Silt Loam	Sand Loam	Silt Loam	Clay	Sandy Loam	Clay Loam		
Topography	-	n/a	n/a	n/a	n/a	Rolling to Hilly	Hilly	Rolling to Hilly	Hilly	Hilly	Rolling to Hilly	Hilly		
WHC (mm)	-	n/a	n/a	n/a	n/a	300	400	75	125	100	150	250		
Pervious Area	m^2	0	0	2,909	22,444	58,558	28,562	80,778	139,506	9,823	31,203	22,828	396,612	
Impervious Area	m^2	408	1,288	0	0	0	0	0	0	0	0	0	1,696	
Total Area	m^2	408	1,288	2,909	22,444	58,558	28,562	80,778	139,506	9,823	31,203	22,828	398,308	
Infiltration Factor														
Soil Sub-Factor	-	n/a	n/a	n/a	n/a	0.4	0.3	0.4	0.3	0.2	0.4	0.2	-	
Land Cover Sub-Factor	-	n/a	n/a	n/a	n/a	0.2	0.2	0.1	0.1	0.1	0.1	0.1	-	
Topography Sub-Factor	-	n/a	n/a	n/a	n/a	0.15	0.1	0.15	0.1	0.1	0.15	0.1	-	
Infiltration Factor	-	0	0	0	0	0.75	0.6	0.65	0.5	0.4	0.65	0.4	-	
Runoff Factor	-	1	1	1	1	0.25	0.4	0.35	0.5	0.6	0.35	0.6	-	
Average Annual Water Balance (in mm/year)														
Inputs														
Precipitation	mm/yr	961	961	961	961	961	961	961	961	961	961	961	-	
Total Inputs	**mm/yr**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**-**	
Outputs														
Actual Evapotranspiration	mm/yr	96	96	596	596	591	594	527	558	544	568	587	-	
Surplus	mm/yr	865	865	365	365	372	366	434	404	418	394	374	-	
Infiltration	mm/yr	0	0	0	0	279	220	282	202	167	256	150	-	
Runoff	mm/yr	865	865	365	365	93	146	152	202	251	138	224	-	
Total Outputs	**mm/yr**	**961**	**961**	**961**	**961**	**963**	**960**	**961**	**962**	**962**	**962**	**961**	**-**	
Average Annual Water Balance (in m^3/year)														
Inputs														
Precipitation	m^3/yr	392	1,238.00	2,795.55	21,568.68	56,274.70	27,448.28	77,628.00	134,065.15	9,439.49	29,986.18	21,938.16	382,774	
Total Inputs	**m^3/yr**	**392**	**1,238**	**2,796**	**21,569**	**56,275**	**27,448**	**77,628**	**134,065**	**9,439**	**29,986**	**21,938**	**382,774**	
Outputs														
Actual Evapotranspiration	m^3/yr	39	124	1,734	13,377	34,608	16,966	42,570	77,844	5,343	17,723	13,400	223,728	
Surplus	m^3/yr	353	1,114	1,062	8,192	21,667	10,482	35,058	56,221	4,096	12,263	8,538	159,046	
Infiltration	m^3/yr	0	0	0	0	16250	6289	22788	28110	1638	7971	3415	86,461	
Runoff	m^3/yr	353	1,114	1,062	8,192	5,417	4,193	12,270	28,111	2,458	4,292	5,123	72,585	
Total Outputs	**m^3/yr**	**392**	**1,238**	**2,796**	**21,569**	**56,275**	**27,448**	**77,628**	**134,065**	**9,439**	**29,986**	**21,938**	**382,774**	

Table I.9: Post-Development Water Budget (SE Site), Fergus Golf Course Redevelopment, Residential Development, Fergus, Ontario

Description	Units	House - Roof	House-Driveway	Sanitary pumping station	Roads	SWM Pond	Wetland	Lawn			Open Space / Landscaping / Parkette		TOTALS	Notes
Soil Type	-	n/a	n/a	n/a	n/a	n/a	n/a	Sand Loam	Silt Loam	Clay Loam	Sand Loam	Silt Loam		
Topography	-	n/a	n/a	n/a	n/a	n/a	n/a	Rolling to Hilly	Rolling to Hilly	Rolling to Hilly	Rolling to Hilly	Rolling to Hilly		
WHC (mm)	-	n/a	n/a	n/a	n/a	n/a	n/a	75	125	100	75	125		
Pervious Area	m^2	0	0	0	0	15,310	34,548	70,347	45,481	22,895	7,566	39,172	235,319	
Impervious Area	m^2	54,796	37,686	400	70,106	0	0	0	0	0	0	0	162,989	
Total Area	m^2	54,796	37,686	400	70,106	15,310	34,548	70,347	45,481	22,895	7,566	39,172	398,308	
Infiltration Factor														
Soil Sub-Factor	-	n/a	n/a	n/a	n/a	n/a	n/a	0.4	0.3	0.2	0.4	0.3	-	
Land Cover Sub-Factor	-	n/a	n/a	n/a	n/a	n/a	n/a	0.1	0.1	0.1	0.1	0.1	-	
Topography Sub-Factor	-	n/a	n/a	n/a	n/a	n/a	n/a	0.15	0.15	0.15	0.15	0.15	-	
Infiltration Factor	-	0	0	0	0	0	0	0.65	0.55	0.45	0.65	0.55	-	
Runoff Factor	-	1	1	1	1	1	1	0.35	0.45	0.55	0.35	0.45	-	
Average Annual Water Balance (in mm/year)														
Inputs														
Precipitation	mm/yr	961	961	961	961	961	961	961	961	961	961	961	-	
Total Inputs	**mm/yr**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**-**	
Outputs														
Actual Evapotranspiration	mm/yr	96	96	96	96	596	596	527	558	544	527	558	-	
Surplus	mm/yr	865	865	865	865	365	365	434	404	418	434	404	-	
Infiltration	mm/yr	0	0	0	0	0	0	282	222	188	282	222	-	
Runoff	mm/yr	865	865	865	865	365	365	152	182	230	152	182	-	
Total Outputs	**mm/yr**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**962**	**962**	**961**	**962**	**-**	
Average Annual Water Balance (in m^3/year)														
Inputs														
Precipitation	m^3/yr	52,659	36,217	384	67,372	14,713	33,201	67,604	43,707	22,002	7,271	37,644	382,774	
Total Inputs	**m^3/yr**	**52,659**	**36,217**	**384**	**67,372**	**14,713**	**33,201**	**67,604**	**43,707**	**22,002**	**7,271**	**37,644**	**382,774**	
Outputs														
Actual Evapotranspiration	m^3/yr	5,260	3,618	38	6,730	9,125	20,591	37,073	25,378	12,455	3,987	21,858	146,114	
Surplus	m^3/yr	47,399	32,599	346	60,642	5,588	12,610	30,531	18,329	9,547	3,284	15,786	236,660	
Infiltration	m^3/yr	0	0	0	0	0	0	19,845	10,081	4,296	2,134	8,682	45,038	
Runoff	m^3/yr	47,399	32,599	346	60,642	5,588	12,610	10,686	8,248	5,251	1,150	7,104	191,622	
Total Outputs	**m^3/yr**	**52,659**	**36,217**	**384**	**67,372**	**14,713**	**33,201**	**67,604**	**43,707**	**22,002**	**7,271**	**37,644**	**382,774**	

Table I.10: Pre-Development Water Budget (WHPA-Q area), Fergus Golf Course Redevelopment, Residential Development, Fergus, Ontario

Description	Units	Wetland	Undeveloped Area (Pasture and Shrubs)		TOTALS	Notes
Soil Type	-	n/a	Sand Loam	Clay Loam		
Topography	-	n/a	Rolling to Hilly	Hilly		
WHC (mm)	-	n/a	150	250		
Pervious Area	m^2	3,062	22,351	14,457	39,870	
Impervious Area	m^2	0	0	0	0	
Total Area	m^2	3,062	22,351	14,457	39,870	
Infiltration Factor						
Soil Sub-Factor	-	n/a	0.4	0.2	-	
Land Cover Sub-Factor	-	n/a	0.1	0.1	-	
Topography Sub-Factor	-	n/a	0.15	0.15	-	
Infiltration Factor	-	0	0.65	0.45	-	
Runoff Factor	-	1	0.35	0.55	-	
Average Annual Water Balance (in mm/year)						
Inputs						
Precipitation	mm/yr	961	961	961	-	
Total Inputs	**mm/yr**	**961**	**961**	**961**	**-**	
Outputs						
Actual Evapotranspiration	mm/yr	596	568	587	-	
Surplus	mm/yr	365	394	374	-	
Infiltration	mm/yr	0	256	168	-	
Runoff	mm/yr	365	138	206	-	
Total Outputs	**mm/yr**	**961**	**962**	**961**	**-**	
Average Annual Water Balance (in m^3/year)						
Inputs						
Precipitation	m^3/yr	2,943	21,479	13,893	38,315	
Total Inputs	**m^3/yr**	**2,943**	**21,479**	**13,893**	**38,315**	
Outputs						
Actual Evapotranspiration	m^3/yr	1,825	12,695	8,486	23,006	
Surplus	m^3/yr	1,118	8,784	5,407	15,309	
Infiltration	m^3/yr	0	5,710	2,433	8,143	
Runoff	m^3/yr	1,118	3,074	2,974	7,166	
Total Outputs	**m^3/yr**	**2,943**	**21,479**	**13,893**	**38,315**	

Table I.11: Post-Development Water Budge (WHPA-Q area), Fergus Golf Course Redevelopment, Residential Development, Fergus, Ontario

Description	Units	House - Roof	House-Driveway	Road	Lawn		TOTALS	Notes
Soil Type	-	n/a	n/a	n/a	Sand Loam	Clay Loam		
Topography	-	n/a	n/a	n/a	Rolling to Hilly	Rolling to Hilly		
WHC (mm)	-	n/a	n/a	n/a	75	100		
Pervious Area	m^2	0	0	0	10,998	9,282	20,280	
Impervious Area	m^2	8,011	5,510	6,069	0	0	19,590	
Total Area	m^2	8,011	5,510	6,069	10,998	9,282	39,870	
Infiltration Factor								
Soil Sub-Factor	-	n/a	n/a	n/a	0.4	0.2	-	
Land Cover Sub-Factor	-	n/a	n/a	n/a	0.1	0.1	-	
Topography Sub-Factor	-	n/a	n/a	n/a	0.15	0.15	-	
Infiltration Factor	-	0	0	0	0.65	0.45	-	
Runoff Factor	-	1	1	1	0.35	0.55	-	
Average Annual Water Balance (in mm/year)								
Inputs								
Precipitation	mm/yr	961	961	961	961	961	-	
Total Inputs	**mm/yr**	**961**	**961**	**961**	**961**	**961**	**-**	
Outputs								
Actual Evapotranspiration	mm/yr	96	96	96	527	544	-	
Surplus	mm/yr	865	865	865	434	418	-	
Infiltration	mm/yr	0	0	0	282	188	-	
Runoff	mm/yr	865	865	865	152	230	-	
Total Outputs	**mm/yr**	**961**	**961**	**961**	**961**	**962**	**-**	
Average Annual Water Balance (in m^3/year)								
Inputs								
Precipitation	m^3/yr	7,699	5,295	5,832	10,569	8,920	38,315	
Total Inputs	**m^3/yr**	**7,699**	**5,295**	**5,832**	**10,569**	**8,920**	**38,315**	
Outputs								
Actual Evapotranspiration	m^3/yr	769	529	583	5,796	5,050	12,726	
Surplus	m^3/yr	6,930	4,766	5,249	4,773	3,870	25,589	
Infiltration	m^3/yr	0	0	0	3,102	1,742	4,844	
Runoff	m^3/yr	6,930	4,766	5,249	1,671	2,128	20,745	
Total Outputs	**m^3/yr**	**7,699**	**5,295**	**5,832**	**10,569**	**8,920**	**38,315**	