



TECHNICAL MEMORANDUM

DATE July 15, 2025

Project No. CA0042515.2530

TO Chris Galway, Senior Land Manager
Lafarge Canada Inc, 6509 Airport Road, Mississauga, ON L4V 1S7

CC Brian Zeman, MHBC Planning, Urban Design & Landscape Architecture

Caitlin Port, MES, MCIP, RPP, Associate
MHBC Planning, Urban Design & Landscape Architecture

FROM Sean McFarland, Phyllis McCrindle

EMAIL sean.mcfarland@wsp.com

RE: LAFARGE GOODWOOD EXTENSION PIT – WSP RESPONSES TO BURNSIDE HYDROGEOLOGY PEER REVIEW COMMENTS

Chris:

The responses to the hydrogeology peer review comments from Burnside are provided below.

Burnside Comment #1

WSP indicates that site operations will not require any pumping or active dewatering. The proposed bottom of the pit is 11 to 12 m below the groundwater level. The Site Plans indicate that above water table extraction in Phases 1 and 2 will be completed followed by below water table extraction. As material is removed from below the water table, groundwater from the surrounding area will flow into the excavation resulting in localized drawdown. The WSP report only discusses potential changes to groundwater levels once the pond is created and extraction is complete. A detailed assessment of potential water level changes (drawdown) during extraction of material below the water table should be provided as that is when the greatest potential for significant short-term drawdown (and potential impacts to nearby domestic wells) is greatest. WSP should quantify the annual volumes that will be extracted from below the water table and the predicted drawdown that will occur. Trigger water levels should be established as part of the monitoring program. These triggers should be designed to be protective of water levels in nearby domestic wells and should include provisions to alter operations if levels are exceeded.

WSP Response

As indicated in the hydrogeological report there will be no significant drawdown during the excavation of the pit above and below the water table. The estimated drawdown in private wells will be very low - <0.01m, corresponding to a <0.1% reduction in the water column. Therefore, it is not necessary to carry out a predictive analysis of incremental drawdown during the excavation below the water table since there is not expected to be a need for the introduction of mitigation during the progressive excavation of the pit. Given minimal groundwater level drawn and the low reduction of water column in the private wells there is no perceived need for trigger water levels in the proposed groundwater level monitoring program.

Any potential complaints from the neighbours on interference on their well water supply will be responded to under the Water Well Complaint Action Plan that are included on the June 2025 ARA Site Plans. This Well

Complaint Action Plan was updated from Section 6.3.1 of the hydrogeological report based on discussions with some of the surrounding neighbours. The updated Well Complaint Action Plan on the ARA Site Plan now reads:

- 1) A groundwater and surface water monitoring shall continue through Operations. The following tasks shall be carried out:
 - Monthly manual groundwater level monitoring at the three on-site monitoring wells.
 - The three onsite monitoring wells shall be equipped with automated pressure transducers with data loggers, a minimum of one year prior to extraction below the water table in order to provide a continuous record of groundwater levels.
 - Annual groundwater quality sampling of the on-site wells shall be completed for general chemistry, metals, bacteria, petroleum hydrocarbons and volatile organic compounds.
 - Annual surface water sampling of the pit pond shall be completed during the period of below water table extraction for general chemistry, metals, bacteria, petroleum, hydrocarbons and volatile organic compounds.
 - If landowner consent is provided, the following private wells shall be included in the monthly groundwater monitoring and annual groundwater sampling program: 4809, 4639, 4709, 4840 and 4860 Concession Road 4.
- 2) The Site domestic well will be decommissioned per O.Reg. 903 by a licensed well contractor either prior to extraction or at such time that extraction encroaches on the well location.
- 3) To address any complaints from residents concerning the impact of the pit operation on their domestic water wells, the following Well Interference Complaint Procedure shall be in place for the following residential wells: 4809, 4639, 4709, 4840, 4860 Concession Road 4:
 - a. Owners of the domestic wells experiencing disruption or quality problems shall immediately notify the Licensee;
 - b. The Licensee, upon receipt of any water supply disruption or water quality complaint, shall retain the services of an independent Qualified Person (QP, i.e. P.Geo. or P.Eng.) to investigate the cause of the complaint;
 - c. If, through the investigation, it is determined that pit operations have caused an adverse effect at the residential well in question, the Licensee, at their expense, either restore or replace the affected water supply.
 - d. If, through the investigation, it is determined that pit operations have not caused an adverse effect to the well in question, the Licensee shall provide a report documenting the results of the investigation to the well owner and retain a copy on-file so that it can be made available upon request by agencies such as the Township, MNR or MECP.
 - e. Prior to extraction below water, a door-to-door water well survey shall be conducted to confirm baseline conditions at private wells within 500 m of the Site.

Burnside Comment #2

WSP should provide some commentary on the potential water quality impacts to groundwater (and domestic wells) because of wildlife using the ponds created by the aggregate extraction. WSP should indicate whether there is potential for coliforms, cryptosporidium and giardia to enter the aquifer. Additional cross sections should be prepared to show the relationship between the pond that will be created and the nearby domestic wells.

WSP Response

The water quality in the pit pond is anticipated to be comparable to that of naturally occurring ponds that are common in the local landscape. During extraction below the water table the local direction of groundwater flow is northward away from the closest residences located adjacent to the southeast corner of the site and these wells would not be at risk. The private wells that are located downgradient of the pit are not expected to be at significant risk from potential water quality impacts due to the anticipated long residence time along the groundwater flow path. Potential water quality impacts to the upgradient wells would be captured through the ongoing monitoring of the three on-site monitoring wells during pit operations and progressive rehabilitation, which includes annual groundwater quality sampling for general chemistry, metals, bacteria, petroleum hydrocarbons and volatile organic compounds.

The potential presence of the microorganisms will be monitored based on surface water sampling of the pit pond during the period of below water table extraction. A new note has been added to the Site Plan to include this surface water monitoring requirement. As recommended in the WSP hydrogeological report, and implemented on the ARA site plan, the annual groundwater sampling and analysis includes bacteria. The closest well downgradient to the pit ponds is MW18-01 which is located near the northeast corner of the site and any bacteria impacts would first be detected at this well. If water quality impacts related to bacteria are detected in this well, an investigation would be undertaken to determine whether the water quality impacts are related to groundwater migrating from the pit ponds, or from local land use such as neighbouring septic systems. If the presence of bacteria in the wells is found to be due to seepage from the pit pond, then the Complaint Response Program would require contingency measures to be implemented by Lafarge to the residents for the affected water wells.

Prior to extraction below water, the ARA Site Plan requires that a door-to-door water well survey will be completed to confirm baseline conditions at private wells within 500m of the site. The annual on-site monitoring results will be compared to the baseline conditions to identify any potential water quality changes. Any potential domestic well issues will be addressed through the Complaint Response Program.

As requested WSP has prepared the attached cross section to show the relationship between the pond that will be created and the near by domestic wells.

Burnside Comment # 3

Burnsides concurs with the recommendation to complete a door-door water well survey at private wells within 500m of the site.

WSP Response

The ARA Site Plan requires that Lafarge complete the door-to-door survey prior to extraction occurring below the water table.

Burnside Comment # 4

The four domestic wells within the potential drawdown zone should be equipped with automatic water level recorders (AWLRs) and preapproval baseline water level monitoring should begin at least one year before any extraction begins. Water quality samples should also be collected to establish pre-extraction water quality. The onsite monitoring wells should also be equipped with AWLRs.

WSP Response

During the well survey, water samples will be collected from private water wells of residents who provide permission for sample collection. These samples will be obtained from taps with untreated water. Field parameters (pH, electrical conductivity and temperature) will be collected at the time of sampling. The water samples will be collected a minimum of one-year prior to extraction below the water table to provide water quality baseline data. The four domestic water wells located in the potential drawdown zone will be fully protected by the Complaint Response Program (see response to Comment # 1).

A new note has been added to the ARA Site Plan, to require that the onsite monitoring wells be equipped with automated pressure transducers with data loggers a minimum of one year prior to extraction below the water table in order to provide a continuous record of groundwater levels. These onsite monitoring wells around the perimeter of the site will be used to assess the potential for well interference during extraction below the water table.

Burnside Comment # 5

It is Burnside's understanding that the active Goodwood pit to the immediate south is also owned and operated by LaFarge. Based on Section B-B1 on the Existing Features Plan (1 of 3) it appears that below water table extraction is to occur on the pit to the south which would result in a much larger pond than shown on Figures 8 and 9. A discussion of how the operations at the two pits should be provided and an integrated groundwater monitoring plan prepared. The predicted water levels in the Goodwood pit extension should be revised as needed based on what is observed at the existing pit.

WSP Response

The pond at the existing pit is not proposed to be connected to the pond at the pit extension as shown on the Rehabilitation Plan (Page 3 of the ARA Site Plan). The water levels in the pit to the south were considered in predicting the water table and establishing the groundwater table elevation at the extension lands as well as the development of the on-site monitoring well network for the proposed pit.

Burnside Comment # 6

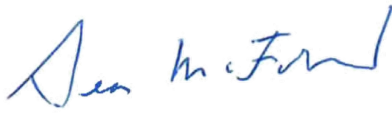
Maximum Predicted Water Table Elevation Technical Memorandum.

The report does not include any discussion of precipitation. As a result, it is known if the water levels represent typical conditions.

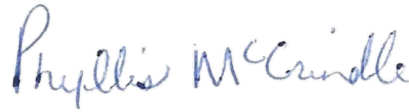
WSP Response

The maximum water table report provides hydrographs of the groundwater levels over a 5 - year period to provide an indication of groundwater level fluctuations in response to changes in precipitation and water budget.

WSP Canada Inc.



Sean McFarland, HBSc, MSc, MBA, LLM, PhD, PGeo
Senior Principal, Senior Hydrogeologist/Fellow



Phyllis McCrindle, MSc, PGeo (ON , NS)
Senior Principal, Senior Hydrogeologist/Fellow

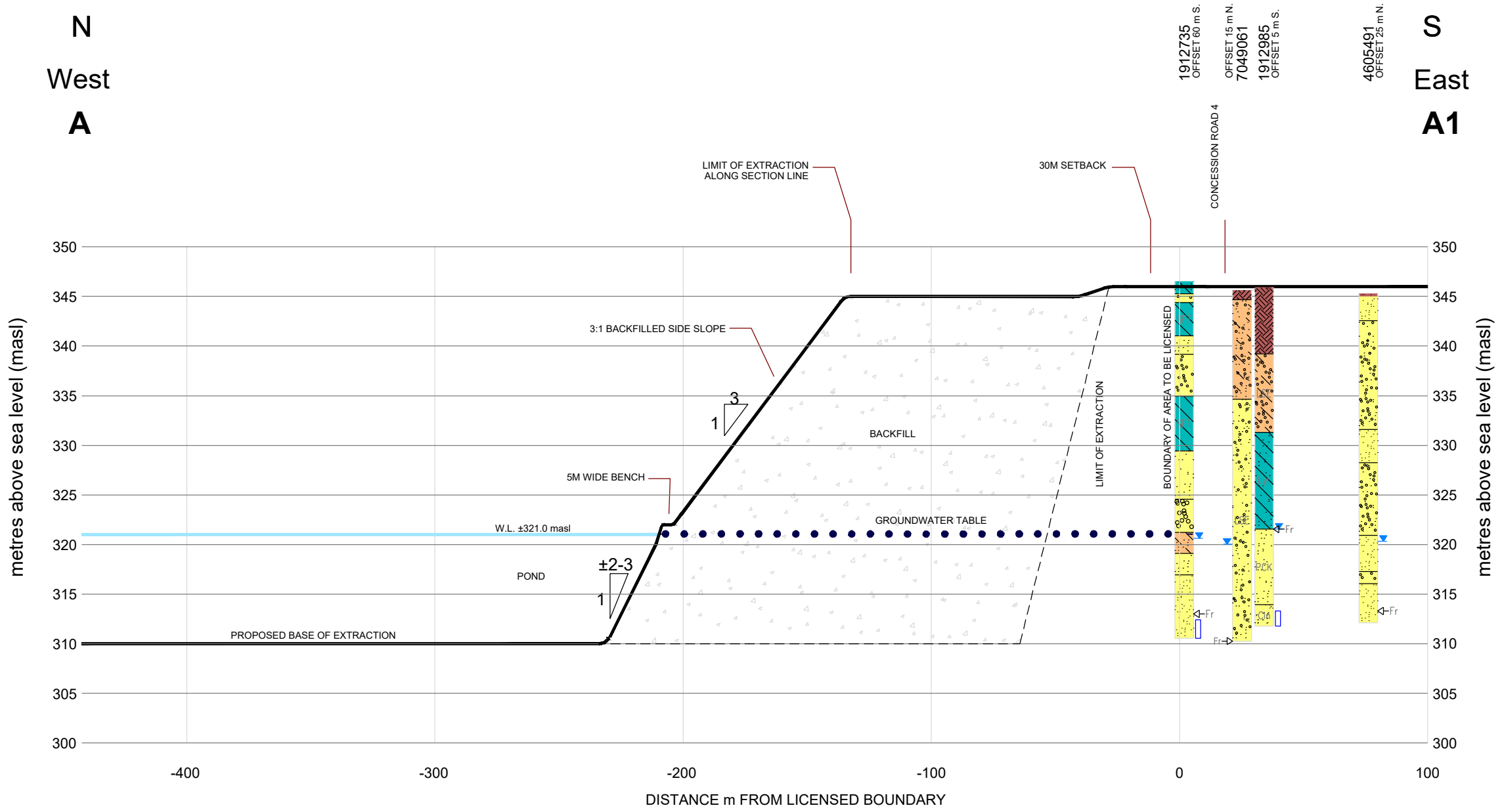
Attachments: Figure 1 - MECP Water Well Cross Section A-A'

SM/PMMC/rk

Path: \\snp-phw-net\CACAMIS\00CTX_Data\SIM\Clients\Lafarge\dem\ON_Lasridge_4thConcession_4800\080_PROD\CA0042515\0001-CH-0001.dwg | File Name: CA0042515\0001-CH-0001.dwg | Last Edited By: gld_jregier Date: 2025-07-16 Time: 7:47:49 AM | Printed By: gld_jregier Date: 2025-07-16 Time: 7:49:22 AM



EXISTING ORTHOIMAGE UNDERLAIN PROPOSED PIT GRADING



PLAN LEGEND

- SITE PROPERTY LINE
- LIMIT OF EXTRACTION
- EXISTING CONTOURS (masl)
- PROPOSED CONTOURS (masl)
- DRILLED OVERBURDEN WELL

SOIL PATTERN LEGEND AND GENERIC SHADING

UNOXIDIZED CLAY BLUE, GREY WHITE, OR UNDEFINED	UNKNOWN
OXIDIZED CLAY BROWN, RED, YELLOW	PEAT/LOAM
SILT	SANDS & GRAVELS
SAND	SAND / GRAVEL / CLAY
GRAVEL	SILT
STONES, PEBBLES	SILT CLAYEY
BOULDER	CLAY

SECTION WELL SYMBOLS

- MECP REPORTED WELL RECORD ID
- RECORDED STATIC WATER LEVEL
- WATER PRODUCING ZONE
- SCREEN

NOTES

MINISTRY OF ENVIRONMENT CONSERVATION AND PARKS (MECP) WATER WELL INFORMATION SYSTEM, KING'S PRINTER. WELL LOCATION AND ELEVATION TO REPORTED MECP CO-ORDINATES. FIELD CORRELATED WELLS ARE SUBJECT TO REVISION.

BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN DETERMINED ONLY AT WELL AND TEST WELL LOCATIONS. BETWEEN THE WELLS AND TEST WELLS, BOUNDARIES ARE NOT PROVEN BUT ARE ASSUMED FROM GEOLOGICAL EVIDENCE.

0 50 100 150 m
1:2500

CLIENT
LAFARGE CANADA INC.

PROJECT
WATER REPORT LEVEL 2
LAFARGE GOODWOOD PIT EXTENSION

TITLE
MECP WATER WELL CROSS-SECTION A-A'

CONSULTANT	YYYY-MM-DD	2025-07-15
DESIGNED		
PREPARED	JPR	
REVIEWED		
APPROVED	SJM	

PROJECT NO. CA0042515 CONTROL 0001 REV. --- FIGURE 1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/B