June 26, 2012 Project No. 10-1125-0034

Mr. Glenn McInnes, President
2246557 Ontario Inc.
202-1422 Wellington Street West
Ottawa, Ontario
K1Y 0X7

WELLHEAD PROTECTION STUDY REVIEW OF SIGNIFICANT THREATS WITHIN THE SHADOW RIDGE WELLHEAD PROTECTION AREA DUE TO DEVELOPMENT OF THE PROPOSED LAKELAND MEADOWS SUBDIVISION, GREELY (CITY OF OTTAWA), ONTARIO

Dear Mr. McInnes:

Golder Associates Ltd. was retained by Lakeland Meadows Ltd. for preparation of this review of significant threats within the existing Wellhead Protection Area (WHPA) to accompany a Draft Plan application to the City of Ottawa in support of phase 2 of the proposed Lakeland Meadows Subdivision, located adjacent to Old Prescott Road, in the Village of Greely, City of Ottawa, Ontario (refer to Figure 1). The overall property measures approximately 59.5 hectares, which includes phases 1 and 2 of the development.

The draft subdivision concept plan was reviewed with the Shadow Ridge WHPA overlay to identify any additional significant threats to the Shadow Ridge water supply due to the development of the proposed subdivision. Significant prescribed drinking water threats from Ontario Regulation 287/07 (under the Clean Water Act) were identified using the "Tables of Drinking Water Threats" for both chemicals and pathogens as published by the Ministry of the Environment (MOE). Recommendations for management of identified threats, in accordance with current draft policies developed by the Raisin-South Nation Source Protection Region are included herein.

The development is proposed in two phases and includes approximately 140 apartment units and 404 lots. Phase 1, which has already been Draft Plan approved, contains 39 rural lots on approximately 19.0 hectares. Phase 2 of the development includes 140 apartment units, 143 single lots, 86 semi-detached lots, and 136 townhouse lots on approximately 40.5 hectares. The layout of the lots is shown in the attached Figure 2.

Portions of the proposed subdivision lie within the WHPA identified for the Shadow Ridge water supply. The WHPA is divided into four zones (WHPA-A, WHPA-B, WHPA-C and WHPA-D) based on the time-of-travel for groundwater to the wellhead. WHPA-A does not intersect the proposed subdivision (refer to Figure 2).

Prescribed Drinking Water Threats

Significant prescribed drinking water threats from Ontario Regulation 287/07 (under the Clean Water Act) were identified using the "Tables of Drinking Water Threats" for both chemicals and pathogens as published by the Ministry of the Environment (MOE). The specific prescribed threats and results of the assessment for the proposed subdivision are as follows:

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- The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the *Environmental Protection Act* (chemicals and pathogens).

  As this is a residential subdivision, it is not anticipated that there will be any establishment, operation or maintenance of a waste disposal site. No additional significant threats are identified in the existing WHPA under this category.

- The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage (chemical and pathogens).

  Both the sewage treatment facility and the stormwater pond are located outside of the existing WHPA.

  Stormwater from the proposed development (Phases 1 and 2) will be collected within the proposed storm sewer and ditch network and conveyed to the stormwater management wet pond to be located on the Shadow Ridge Subdivision to the south, pending resolution of a cost-sharing agreement. The storm servicing of the development will be by a gravity sewer system draining to the Shadow Ridge Subdivision where it will be attenuated by the stormwater management wet pond.

  Sanitary flows from Phase 2 will be directed to the Shadow Ridge Subdivision to be treated at the communal peat filter and constructed wetland treatment system. Similar to Shadow Ridge, it is proposed that septic tanks will be located at each residence or block of residences within registered municipal easements. Periodic pump-outs will be coordinated through the City of Ottawa. The effluent from the septic tank will discharge by gravity to a small diameter gravity sewer system located in the municipal road allowance.

  The sanitary servicing for Phase 2 of the development will be by a small diameter gravity sewer system draining to the Shadow Ridge Subdivision to the South. The small diameter gravity sewers will be constructed using high-density polyethylene (HDPE) pipe with fused joints. As well, cleanouts will be installed along the length of the sewer to eliminate any mechanical connections at maintenance holes. No inflow or leaks within the system are expected as the piping system will not have any maintenance holes. The system will be pressure tested prior to being put into service.

- The application of agricultural source material to land (chemical and pathogens).

  As this is a residential subdivision, it is not anticipated that there will be any application of agricultural source material to land. No additional significant threats are identified in the existing WHPA under this category.

- The storage of agricultural source material (chemical and pathogens).

  As this is a residential subdivision, it is not anticipated that there will be any storage of agricultural source material. No additional significant threats are identified in the existing WHPA under this category.

- The application of non-agricultural source material to land (chemical and pathogens).

  As this is a residential subdivision, it is not anticipated that there will be any application of non-agricultural source material to land. No additional significant threats are identified in the existing WHPA under this category.

- The handling and storage of non-agricultural source material (chemical and pathogens).

  As this is a residential subdivision, it is not anticipated that there will be any handling or storage of non-agricultural source material. No additional significant threats are identified in the existing WHPA under this category.

- The application of commercial fertilizer to land (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any application of commercial fertilizer to land. No additional significant threats are identified in the existing WHPA under this category.

- The handling and storage of commercial fertilizer (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any handling or storage of commercial fertilizer. No additional significant threats are identified in the existing WHPA under this category.

- The application of pesticide to land (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any significant application of pesticide to land. No additional significant threats are identified in the existing WHPA under this category.

- The handling and storage of pesticide (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any handling or storage of pesticide. No additional significant threats are identified in the existing WHPA under this category.

- The application of road salt (chemical).

  Additional significant chemical threats to the WHPA B may be introduced due to the application of road salt.

- The handling and storage of road salt (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any handling or storage of road salt. No additional significant threats are identified in the existing WHPA under this category.

- The storage of snow (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any storage of snow. No additional significant threats are identified in the existing WHPA under this category.

- The handling and storage of fuel (chemical).

  As this is a residential subdivision, and it will be serviced with natural gas, it is not anticipated that there will be any handling or storage of fuel. No additional significant threats are identified in the existing WHPA under this category.

- The handling and storage of a dense non-aqueous phase liquid (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any handling or storage of dense non-aqueous phase liquids. No additional significant threats are identified in the existing WHPA under this category.

- The handling and storage of an organic solvent (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any handling or storage of organic solvents. No additional significant threats are identified in the existing WHPA under this category.

- The management of runoff that contains chemicals used in the de-icing of aircraft (chemical).

  As this is a residential subdivision, it is not anticipated that there will be any runoff that contains chemicals used in the de-icing of aircraft. No additional significant threats are identified in the existing WHPA under this category.

- The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard (chemical and pathogens).

  As this is a residential subdivision, it is not anticipated that there will be any use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard. No additional significant threats are identified in the existing WHPA under this category.

Threat Policies

The Raisin-South Nation Source Protection Region have prepared a Draft Proposed Source Protection Plan (SPP; version 0.1.0 dated February 29, 2012) to address existing and future significant threats to the identified drinking water sources within their Source Protection Region. The identification of threats within the Source Protection Region are limited to the areas identified as wellhead protection areas (WHPA; groundwater sources) or intake protection zones (IPZ; surface water sources). The SPP includes a number of policies for the various existing and future identified significant threats within the Source Protection Region.

Portions of the proposed subdivision lie within the WHPA identified for the Shadow Ridge water supply. The significant threats identified in the previous section are generally applicable to the WHPA-A and WHPA-B zones (within the larger WHPA for the Shadow Ridge well); however, WHPA-A does not intersect the proposed subdivision (refer to Figure 2).

Proposed policies exist for all of the identified significant threats within the WHPA. The proposed policies (or the final version of those policies, once approved) and the prescribed monitoring requirements outlined in the SPP should be followed for development within the proposed subdivision to ensure that no new significant threats are added to the WHPA. The relevant policies as written in the SPP (version 0.1.0 dated February 29, 2012) for the potential significant threats identified for the proposed subdivision are as follows:

The Establishment, Operation or Maintenance of a System that Collects, Stores, Transmits, Treats or Disposes of Sewage

- Sanitary sewer maintenance program for existing and future sewage works.

  The municipality shall implement a sanitary sewer inspection and maintenance program where sanitary sewers and related pipes could be a significant threat. The program will include cleaning and camera inspection to identify areas of in/exfiltration. Exfiltration testing may be used in place of camera inspection. For existing systems, the sewer inspection and maintenance shall occur at five year intervals when the Source Protection Plan takes effect.

  All future related pipes in the significant threat area shall be installed to a higher standard such as water main quality pipe. Future sanitary sewers shall be inspected at least every 10 years.

This policy takes effect when the Source Protection Plan takes effect.

The Application of Road Salt

- Municipal Salt Management Plans for existing storage of salt and snow and future and existing application of road salt.

  Where the existing storage of road salt and snow, and the future and existing application of salt could be a significant drinking water threat, the municipality shall develop or review/update their Salt Management Plan (SMP). The SMP will include at a minimum:

  - Management of sodium or chloride compounds used for dust suppression.
  - Attempting to move all salt and snow storage areas outside of the WHPAs and IPZs.
  - Minimizing application of road salt, and/or use of alternative compounds.
  - Training for staff (such as Smart About Salt).
  - Best Management Practices for salt application and salt and snow storage (including snow pile melt-water management) outlined by Environment Canada and the Transportation Association of Canada.

  The SMP will be initiated within one year and completed within two years of the Source Protection Plan taking effect after which it shall be reviewed annually to ensure it meets all current best management practices outlined by Environment Canada and the Transportation Association of Canada.

- Education and outreach for private facilities through the Salt Institute.

  It is recommended that the Salt Institute implement an education and outreach program which targets private facility managers and salt application contractors in areas where this activity could be a significant drinking water threat. This program may be based on the Smart About Salt program, or may include Best Management Practices (BMP) from Transportation Association of Canada, 2003 or Best Practices for Salt Use on Private Roads, Parking Lots and Sidewalks.

General

- Source Water Protection – Education and Outreach.

  Within one year of the Source Protection Plan taking effect, the municipality shall establish an education and outreach program where activities could be a significant drinking water threat. The program shall be targeted at residents, farms and businesses. The program shall promote:

  - Awareness of source protection and the location of vulnerable areas.
  - Proper septic system care and maintenance.
  - Best Management Practices to reduce or eliminate impacts from activities which pose a threat to source water.
  - Awareness of Ontario's cosmetic pesticide ban and Best Management Practices where pesticides are used under an exemption from the ban.
  - The importance of complying with all content of the Pesticide Safety Course.

- Best Management Practices regarding the handling and storage of pesticides.
- Area-wide education and outreach programs promoting integrated pest management and alternative pest control, targeting golf courses and sports fields.
- Participation in the Environmental Farm Plan Program.
- Awareness regarding non-agricultural source material application for landowners.
- The alternatives to dense non-aqueous phase liquids and organic solvent substances that do not pose a threat to drinking water in addition to proper disposal of dense non-aqueous phase liquids and organic solvents; program will target both commercial/industrial and residential landowners.
- Awareness of stormwater management relating to storm-drains and dangers linked to dumping chemicals into drains (example: 'Only Rain in the Drain') within the urban sewer catchment area.
- Consider the creation and promotion of a year-round depot drop-off for hazardous wastes in vulnerable areas.
- Work with the Source Protection Authority to provide information regarding applicability of funding under the Ontario Drinking Water Stewardship Program (ODWSP) or other applicable incentive programs.

The municipality shall establish an education and outreach program to inform people about the importance of proper construction, operation and maintenance of their oil burning equipment (furnace, generator) and alternative fuel options. The program could include:

- Distribution of a sticker to be placed on oil tanks that indicates that the tank is located in a vulnerable area and provides a procedure to follow in the event of a fuel spill or leak, including a spill response contact number.
- Promotion of existing incentive programs including incentive programs for switching to alternative fuel sources.
- Encouraging property owners to:
  - Replace single-walled tanks and tanks older than 15 years old.
- Provide information relating to:
  - Procedures to follow in the event of a spill.
  - The mandatory requirements for fuel tank usage and maintenance.
  - Best Management Practices for fuel tank usage and maintenance.

The municipality may enter into an agreement with a third party to implement the education and outreach program and/or any related reporting.

General education and outreach programs should be harmonized with existing education and outreach programs where this would result in an increase in efficiency or cost-effectiveness.

The program shall be implemented within three years.

Closure

We trust this Wellhead Protection Study is sufficient for your current needs. Should you require any clarification, or additional information, please do not hesitate to contact the undersigned.

Yours truly,

GOLDER ASSOCIATES LTD.

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BH/BTB/bg
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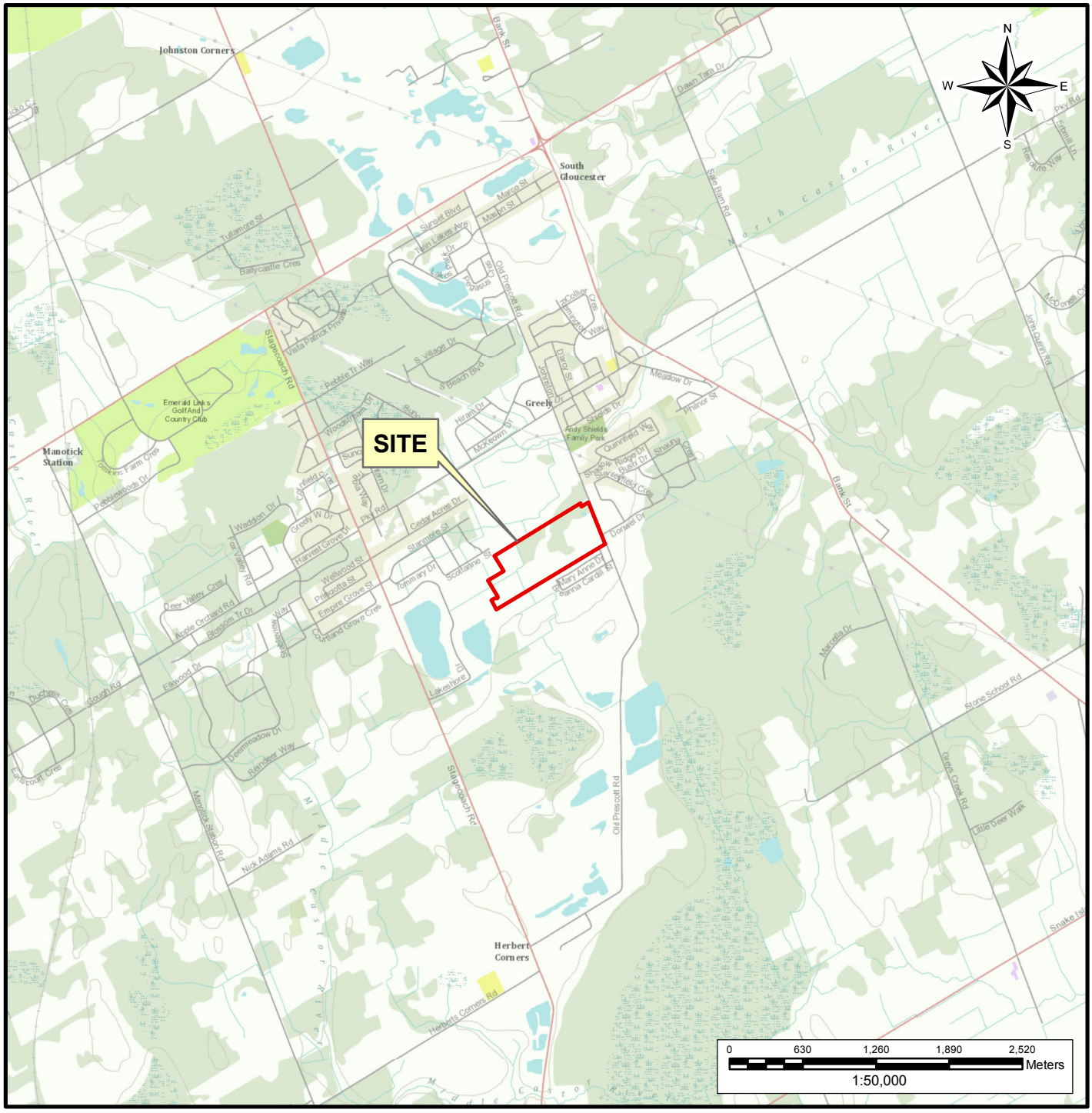
Attachments: Figure 1 – Key Plan
Figure 2 – Wellhead Protection Areas Site Plan



NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 10-1125-0034

REFERENCE

BASEMAP: ESRI, DELARME, NAVTEQ, TOMTOM, INTERMAP, iPC, USGS, FAO, NPS, NRCAN, GeoBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), AND THE GIS USER COMMUNITY
DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18

Golder Associates
Ottawa, Ontario

PROJECT No.	10-1125-0034
SCALE	AS SHOWN
REV.	0
DATE	June 2012
DESIGN	BH
GIS	JEM
CHECK	BH
REVIEW	BTB

TITLE

KEY PLAN

PROJECT: LAKELAND MEADOWS LTD.
LAKELAND MEADOWS SUBDIVISION - PHASE 2
OTTAWA, ONTARIO

FIGURE 1

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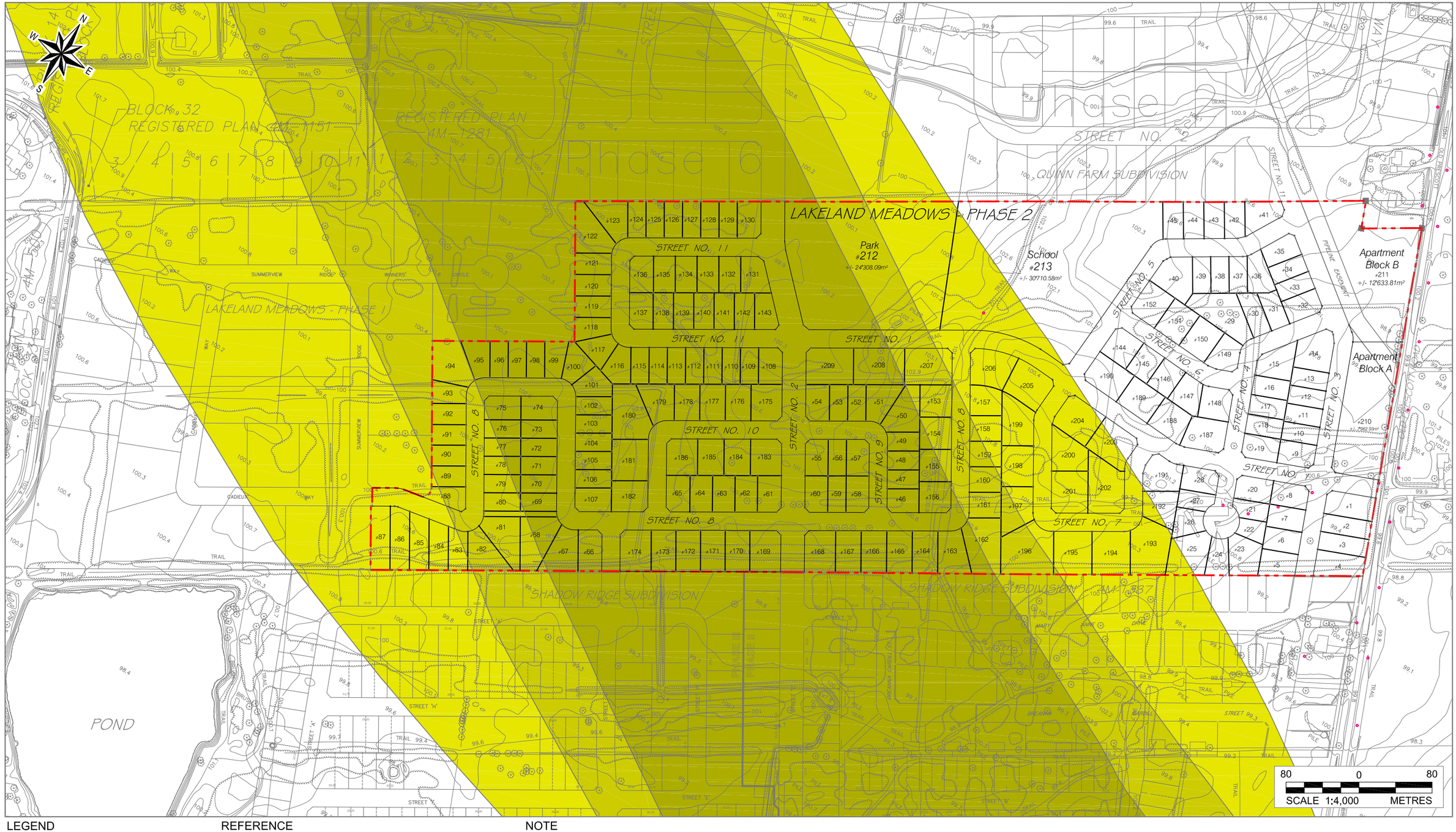

LEGEND

- PROPERTY LINE
- LOT LINE
- CONTOURS INTERVAL (0.5 m)
- WHPA B
- WHPA C
- WHPA D

REFERENCE

1. SURVEY AND LOT LAYOUT PROVIDED BY HOLZMAN CONSULTANTS INC.

2. 1:2000 SCALE DIGITAL MAPPING PROVIDED BY CITY OF OTTAWA CORPORATE SERVICES DEPARTMENT SURVEYS AND MAPPING RECEIVED ON APRIL 19, 2004

3. WELLHEAD PROTECTION AREA INFORMATION PROVIDED BY SOUTH NATION CONSERVATION

NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 10-1125-0034

Golder Associates
Ottawa, Ontario

FILE No.	1011250034-9999-DP1v03(WHPA)OVERLAY PHASE 2v2.dwg
PROJECT No.	10-1125-0034
REV.	
SCALE	AS SHOWN
DATE	June 2012
DESIGN	BH
CADD	PLG
CHECK	BH
REVIEW	BTB

TITLE

WELLHEAD PROTECTION AREAS SITE PLAN

LAKELAND MEADOWS LTD.
LAKELAND MEADOWS SUBDIVISION - PHASE 2
OTTAWA, ONTARIO

FIGURE 2

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