EES1129H - Brownfields Redevelopment
Lecture: Wednesday, 19h00-21h00 in MW140

COURSE DESCRIPTION

This course will introduce students to the technical requirements of brownfields redevelopment in Ontario.

Brownfields are usually former industrial lands that are now vacant or underused but have the potential to be redeveloped for new uses. Brownfields may be contaminated due to past or present activities, and left unmanaged, may pose risks to the environment and human health because of potential contaminants that may be found in soil, sediment, and/or groundwater as a result of past activities at the site.

Economics drive the redevelopment of brownfields, including closed factories, gas stations, and waterfront properties formerly used for commercial operations, however, in Ontario, brownfields redevelopment is regulated by Ontario Regulation 153/04 – Records of Site Condition made under Part XV.1 of the Environmental Protection Act.

Students will explore the complexity of O.Reg. 153/04, including how to prepare Phase One and Phase Two Environmental Site Assessments to support the filing of a Record of Site Condition.

COURSE OBJECTIVES

The objective of this course is to introduce students to Ontario Regulation 153/04 made under Part XV.1 of the Environmental Protection Act. Students will be introduced to the technical requirements of brownfields redevelopment in Ontario and provided information to allow them to understand Phase One and Phase Two Environmental Site Assessment as described by O.Reg. 153/04, as amended. Upon completion of the course students should be able to participate meaningfully in undertaking these investigations under the supervision of a Qualified Person.

SCHEDULE

The following topics will be covered:
- Introduction of the Instructor
- Introduction to O.Reg. 153/04, as amended
  - What is a brownfield?
  - Why redevelop brownfields?
  - How to redevelop brownfields in Ontario – regulatory requirements?
  - What is a Phase I ESA? Phase II ESA? Risk Assessment?
- Introduction to Site Condition Standards
- Assignment 0: Potentially Contaminating Activities and Contaminants of Concern. Choose one from Table 2 of Schedule D and email it to the TA before next lecture.
- Required Reading:
  - O.Reg 153/04
Week 2 – Phase I ESA. September 20, 2017.
The following topics will be covered:

- Phase I Environmental Site Assessment (O.Reg. 153/04, Part VII)
  - Part VI
  - Part VII
  - Schedule D
  - Phase I ESA site visit checklist

- Assignment 1: Phase I ESA Historical Review – visit the Toronto Reference Library to conduct a historical review of a property in your neighborhood to meet the general objectives of a Phase I ESA. You will use the findings of your historical review to guide your field observations in Week 3.

- Required reading:
  - O.Reg. 153/04, Part VI and Part VII
  - O.Reg. 153/04, Schedule D
  - Guide for Completing Phase One Environmental Site Assessments under Ontario Regulation 153/04, June 2011

- Discussion:
  - Soil maps, HWIN directory, available historical resources

Week 3 – Phase I ESA (Cont’d). September 27, 2017.
Hand in Assignment 1: Phase I ESA Historical Review
The following topics will be covered:

- Phase I Environmental Site Assessment (O.Reg. 153/04, Part VII)
  - Part VII
  - Schedule D

- Assignment 2: Phase I ESA Field Inspection – conduct a Phase I ESA site visit of a property in your neighborhood where, from public vantage points (no trespassing) you are able to meet the general objectives of a Phase I ESA, and specifically you will use your field observations to establish a Phase I Conceptual Site Model which includes a list of potentially contaminating activities (PCAs), and a complete list of contaminants of potential concern (COPC).

- Discussion:
  - Field Activity progress, questions, troubleshooting

Week 4 – Phase II ESA. October 4, 2017.
Hand in Assignment 2: Phase I ESA Field Inspection.
The following topics will be covered:

- What is a Phase II ESA
  - Phase II Environmental Site Assessment (O.Reg. 153/04, Part VIII)
    - Part VI
    - Part VIII
    - Schedule E

- Required Reading
  - O.Reg. 153/04, Part VI and VIII
  - O.Reg. 153/04, Schedule E


Week 5 – Planning the Phase II ESA. October 11, 2017.
The following topics will be covered:

- Planning the Phase II ESA
  - Number of proposed boreholes/monitoring wells and/or test-pits
    - Borehole location planning
  - Number of proposed soil and groundwater samples
    - Data Quality Objectives (DQO), Quality Assurance (QA), and Quality Control (QC)
  - Cost estimating
  - Health and safety
    - Utility locates
    - PPE

- Required Reading
  - O.Reg. 153/04, Schedule E

- Assignment 3: Phase II ESA Proposal and Cost Estimate – using the information covered in class, prepare a detailed cost estimate to complete a Phase II ESA (field investigation). Required information (such as cost per hour for human resources and equipment, or cost per analysis for laboratory testing) will be provided.
Week 6 – Applicable Site Condition Standards (SCS). October 18, 2016
The following topics will be covered:

- Current and Proposed Future Uses
- Applicable Site Condition Standard
  - Section 35
  - Section 41
  - Section 43.1
  - Soil Texture (Section 42)

Week 7 – NO CLASS SCHEDULED. October 25, 2017.
Hand in Assignment 3: Phase II ESA Cost Estimate (email submission)

The following topics will be covered:

- Reporting Analytical Data
  - Method Detection Limits
  - Reporting Limits
- Quality Assurance and Quality Control
- Required Reading
  - Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act
  - O.Reg. 153/04 Sections 47, 48 and 49
  - O.Reg. 153/04 Schedule E

The following topics will be covered:

- Soil Quality
- Ground Water Quality
- Ground Water Elevations and Flow Direction
- Phase II Conceptual Site Model
- Assignment 4: Phase II ESA Applicable SCS and Laboratory Analytical Data - Determine the applicable site condition standards using the proposed future use (provided in class) and by analyzing borehole logs and grain size curves provided. Use the borehole logs and grain size curves to prepare cross-sectional diagrams. Compare data provided by the instructor to the applicable SCS. Using figures provided by the instructor and your analysis of the analytical data, delineate contaminated soil and groundwater and plot results as a series of figures. Using groundwater elevation data provided by the instructor establish horizontal hydraulic gradients. Plot groundwater elevations to demonstrate groundwater flow direction

The following topics will be covered:

- Brownfields remediation (Case Study)

Hand in Assignment 4: Phase II ESA Applicable SCS and Laboratory Analytical Data
The following topics will be covered:

- Assignment 5: Component Screening (Risk Assessment) - Determine which site condition standards (SCS) are applicable at the site. Screen maximum soil and groundwater concentrations against applicable SCS and determine what the soil and groundwater contaminants of concern (COC) are at the site. For all soil and groundwater contaminants of concern identified at the Site, complete a secondary criteria component screen using the appropriate table of component values for the SCS applicable at the site to determine what exposure pathways may be of concern. Complete a human health conceptual site model (CSM)
Hand in Assignment 5: Component Screening
The following topics will be covered:
• Soil Brought to the Phase Two Property
• Management of Excess Soil (import and export)
• Proposed changes to O.Reg. 153/04

Week 12 – Record of Site Condition (RSC). November 29, 2017.
The following topics will be covered:
• Filing a Record of Site Condition
  - Technical requirements (scope)
  - Time implications (schedule)
  - Cost implications (cost)
• Case Studies – RSC activities in GTA:

KEY DATES AND DEADLINES
Please refer to the week-by-week breakdown (see below) for more information.

Table 1: Summary of Key Dates

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<th>Week</th>
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<td>1</td>
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<td>2</td>
<td>September 20</td>
<td>Hand in Assignment 0 (2%)</td>
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<td>3</td>
<td>September 27</td>
<td>Hand in Assignment 1 (14%)</td>
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<td>4</td>
<td>October 4</td>
<td>Hand in Assignment 2 (10%)</td>
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EVALUATION
Course work will be based on the timely completion of assignments. Environmental Site Assessments are completed as part of the real estate due diligence process at the beginning of the redevelopment of a site. Often the completion of a commercial real estate transaction is contingent on the results of the site assessment project(s). For this reason, we will consider ourselves in the consulting environment where meeting a client deadline is critical. Course work must be handed in at the beginning of the lecture in the week it is due. Late assignments will not be evaluated, just as late project deliverables in the consulting environment often result in unpaid invoices.

An overview of each assignment and its assessment criteria will be provided with each assignment. Assignments are each worth 10% of the course grade. The final exam is worth 40% of the course grade.

Evaluation will be carried out in accordance with the Graduate Grading and Evaluation Practices Policy (and how that policy is interpreted and applied in this Dept.)

EMERGENCY PLANNING
Students are advised to consult the university's preparedness site (http://www.preparedness.utoronto.ca) for information and regular updates regarding procedures relating to emergency planning.

ACCESSIBILITY NEEDS
The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact The UTSC Accessibility Services as soon as possible: http://www.utsc.utoronto.ca/~ability/

We also suggest you also refer to the following University of Toronto Scarborough Library link: http://utsc.library.utoronto.ca/services-persons-disabilities
PLAGIARISM

University of Toronto code of Behaviour on Academic Matters states that "it shall be an offense for a student knowingly: to represent as one's own any idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e., to commit plagiarism."

For accepted methods of standard documentation formats, including electronic citation of internet sources please see the UofT writing website at: http://www.writing.utoronto.ca/advice/using-sources/documentation

The full Code of Behaviour regulations could be found from consulting http://www.sgs.utoronto.ca/facultyandstaff/Pages/Academic-Integrity.aspx

WRITING AND ENGLISH LANGUAGE

As well as the faculty writing support, please see English Language and writing support at University of Toronto: http://www.sgs.utoronto.ca/currentstudents/Pages/English-Language-and-Writing-Support.aspx

Students have commented that they found the latter address extremely helpful for writing term papers.

The following are also useful:


LATE WORK

Late assignments will not be marked unless the circumstances are extenuating and prior arrangements have been made with the instructor or the Teaching Assistant.

READINGS

The following will be the required texts for the course.

- Ontario Regulation 153/04, Records of Site Condition, as amended, made under Part XV.1 Of The Environmental Protection Act.
- Guide for Completing Phase One Environmental Site Assessments under Ontario Regulation 153/04, June 2011
- Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04, June 2011
- Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Ministry of the Environment, April 15, 2011
- Rationale For The Development Of Soil and Ground Water Standards For Use At Contaminated Sites In Ontario, Standards Development Branch, Ontario Ministry of the Environment, April 15, 2011
- Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, Laboratory Services Branch, Ministry of the Environment, March 9, 2004, amended as of July 1, 2011
- Environmental Protection Act

FINAL EXAM DATE

TBA