

**CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS**

**E-3 ENVIRONMENTAL MANAGEMENT**

**March 2011**

**Note: The use of calculators or similar devices is not permitted in this exam.**

**Note: This examination consists of 8 questions on 2 pages.**

**Marks**

**Q. No**

Time: 3 hours

Value   Earned

1.	<p>Conventional development and storm drain system design consists of directly connected impervious streets, driveways, sidewalks and structures that convey untreated runoff to curb and gutter systems, storm drain inlets and a network of underground storm drain pipes. They are designed to convey storm water away from developed areas as quickly as possible. This has been the engineering standard for approximately the last 50 years.</p> <p>a) Discuss some of the off-site effects of this type of stormwater management. Consider this in the context of residential and industrial/commercial development, as well as from the perspective of both water quantity and quality.</p> <p>b) Describe low-impact practices designed to minimize the deleterious off-site impacts listed in a).</p>	15	
2.	<p>Acts and regulations pertaining to management of contaminated sites vary across Canada. In its introduction to environmental site assessments, CHMC describes three different phases of ESAs.</p> <p>a) Briefly describe these phases and identify the conditions in brownfield development that would trigger each of them.</p> <p>b) What liabilities would accrue to a purchaser of land if pre-existing contamination is discovered only after the transaction has been completed? How can he protect himself from these liabilities?</p>	15	
3.	<p>Imagine you are working for a land developer who is proposing a Greenfield subdivision that is immediately adjacent to a sensitive stream containing fish habitat.</p> <p>a) What Federal Act is potentially relevant in this situation? Identify two specific ways that the development could contravene the act.</p> <p>b) Discuss measures that you would suggest to minimize your client’s potential liability with respect to this act.</p>	15	
4.	<p>A new high-density residential development is planned for an area that overlaps what the Provincial authorities have identified as a sensitive (or vulnerable) aquifer that is further characterized as “unconfined”.</p> <p>a) What is meant by an unconfined aquifer?</p> <p>b) What are the potential impacts that the Province may be concerned about?</p> <p>c) What steps could be taken in the planning, design and construction of this development to minimize these potential impacts?</p>	5 5 5	

5.	<p>Your firm is laying out a corridor for a transmission line through a forested area. Although the Migratory Birds Convention Act is aimed mainly at hunting, Section 6(a) of the Regulation states:</p> <p>“..... no person shall disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird.....”</p> <p>a) How might your firm’s client be in contravention of the MBCA?</p> <p>b) What steps should the client take to ensure they are not in contravention?</p>	3 3	
6.	<p>A developer plans a large subdivision in a forested area that has been deemed by both the Province and the Local Government to have significant biodiversity and wildlife habitat values. The local government will not grant any permit unless the developer has set aside at least 35% of the gross area for habitat protection.</p> <p>a) How would you plan to incorporate that protection? Consider both location and distribution of the protected habitat.</p> <p>b) Assume the habitat has been protected and the development is built out according to plan. What are the potential medium and long-term threats to the habitat?</p> <p>c) What other measures could you suggest to mitigate the loss of wildlife habitat and biodiversity in the developed portion of the area?</p>	3 3 3	
7.	<p>You have been asked to provide surveying and development services for a 40 ha aggregate mining operation under a detailed 20-year plan drawn up by a geological consultant. The operation will take place on Aboriginal Land and lies within 0.5 km of a community.</p> <p>a) Will an environmental assessment, under the CEAA, be required?</p> <p>b) Make a list of the potential environmental issues arising from this proposed development, and describe possible options for mitigation.</p> <p>c) Assume a reclamation plan is required for permitting. What would be the objectives of this plan, and what general steps would be needed to achieve those objectives?</p>	5 5 5	
8.	<p>Refer to question 5. The distribution line will require several hundred hectares of forest clearing. Some of the timber is merchantable and some can be sold as firewood.</p> <p>Will this increase or decrease the production of greenhouse gases? Discuss the effects of forest clearing on greenhouse gas balance, considering both short and long term effects.</p>	10	
<b>Total Marks:</b>		100	