# ASSOCIATION OF CANADA LANDS SURVEYORS
# BOARD OF EXAMINERS

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## EXAMINATION P1
## ACTS AND REGULATIONS RELATING TO SURVEYS OF CANADA LANDS

**October 2013**

Notice to Candidates:
This examination is based on the *General Instructions for Surveys, e-Edition* published by the Surveyor General of Canada Lands.

This examination consists of 11 questions on 5 pages.

| Q. No | Time: 3 hours | Marks Value | Marks Earned |
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| 1 | A Canada Lands Surveyor is engaged by the holder of a lease of a parcel of Yukon Lands to make a legal survey of the parcel so that title can be obtained. The lessee has complied with all requirements of the lease that was issued in 2011.<br>The sketch plan forming part of the lease agreement shows a square parcel with sides 1,800.0 metres in cardinal directions. It shows a wooden application post established at its southwest corner.<br>The sketch plan also shows that the northeast corner lies near the centre of a shallow, non-navigable pothole lake that forms part of the lease area. This lake is approximately 200 metres in diameter. The vegetation in the area is medium-size Spruce and Poplar.<br>The CLS obtained the necessary authorization for the survey and his instructions from the Surveyor General confirmed that the lake is to be included in the parcel for which Lot 1012, Quad 116 A/16 was assigned. The instructions also requested that the natural boundary of the lake be shown on the plan as well as the area of lake within the lot to assist with the final purchase pricing.<br>The CLS conducted the field survey between June 6 and 10, 2012 after locating the lessee's wooden application post. There were no other official surveys or geodetic control stations within 20 km and the CLS had GPS equipment available for the survey.<br>All boundaries on land were surveyed on the true boundary and acceptable angular and distance closures were achieved. A small single storey cabin close to the southwest corner was tied to the monument established at that corner.<br>a. Under what statute would the lease have been issued?<br>b. Under what statute would the lease have been issued if it had been issued in 1998?<br>c. What statute governed the legal survey that the CLS conducted?<br>d. What type of monuments would the CLS have used for the survey?<br>e. What acceptable methods could have been used to determine the natural boundary of that part of the lake lying within the parcel?<br>f. What acceptable methods could have been used for bearing derivation for the survey?<br>g. Making necessary assumptions for other details not provided, prepare a neat plan at an | 1<br>1<br>1<br>1<br>2<br>2 | |

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| | appropriate scale showing ONLY the body for the combined plan and field notes which the CLS would have prepared for submission to the Surveyor General. Show all details required by the *GIS-e*.<br>h. Provide the formula that would have defined the maximum angular misclosure for the survey and define its terms.<br>i. Provide the formula that would have prescribed the minimum accuracy required for the survey based on the 95% confidence region and define its terms.<br>j. As a remote survey, what is the minimum required accuracy for its geo-referencing?<br>k. Write the title for the combined plan and field notes. Other information and legend details are not required. Make assumptions for any required information not provided.<br>l. What action would the Surveyor General have taken once the plan and field notes had received technical and administrative approvals? | 7<br>2<br>3<br>1<br>4<br>1 | |
| 2 | Pursuant to the Canada Oil and Gas Land Regulations:<br>a. What defines the east and west sides of a grid area?<br>b. What defines the north and south sides of a grid area?<br>c. Draw a neatly labeled sketch of grid areas 70°10'/85°30', 70°00'/85°30' and 70°00'/ 85°45'. Number the sections along the inside perimeter of these three grid areas. | 2<br>2<br>5 | |
| 3 | What condition must be satisfied before a complaint respecting professional misconduct or incompetence may be referred to the Discipline Committee of the Association of Canada Lands Surveyors? | 2 | |
| 4 | With respect to the *Quartz Mining Act* currently in force:<br>a. How many adjoining claims can be grouped by their owner(s) for the performance of work?<br>b. What are the prescribed minimum dimensions for a legal post made from timber?<br>c. Explain the two types of gores that can occur when locating quartz mining claims and illustrate each by a neat sketch.<br>d. Explain the action you would take when a legal post for a claim you are making a legal survey of cannot be found and all others in the large group of claims have been found.<br>e. Explain the main purpose for the requirement to post notice and advertise the completion of a legal survey of one or more claims. | 1<br>1<br>4<br>2<br>2 | |
| 5 | Identify the statute that defines the wilful removal of a boundary marker placed by a land surveyor to mark any limit, boundary or angle of a concession, range, lot or parcel of land to be an indictable offence. | 2 | |
| 6 | In 2006 Herbert Larsen staked a 1-mile creek Lease to Prospect on Rabbit Creek in the Klondike Mining District of Yukon. His creek lease included ground both south and north of baseline angle 9 at which the baseline deflects approximately 20° to the east to angle 10. He had no trouble finding CLS 77 monuments at angles 8, 9 and 10 from a recent official baseline resurvey. Rabbit Creek had both current and historical mining and placer claim activity.<br>He had carefully measured the distance to be 3,710 feet on the baseline from his downstream legal post at bearing 10° 30' to angle 9, and continued along the next course of the baseline at 30° 40' a distance of 1,570 feet from angle 9 to establish his upstream legal | | |

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| | post on the baseline between angles 9 and 10.<br><br>Prior to the termination of the lease and having satisfied expenditure and other work requirements, Larsen staked out creek claims in his lease area as provided for in the *Placer Mining Act*, but to avoid the possibility of leaving any "open" ground, carefully measured out and each claim 3 feet shorter than the maximum length available. He continued his staking in such a manner until he reached his original upstream legal post for the lease. He named the claims HERB with numbering from 1upwards as he proceeded upstream. His final claim length together with the downstream claims verified his original lease measurement within 3 feet.<br><br>a. Using the above information and any other necessary assumptions, draw a neat sketch at an appropriate scale showing all pertinent <u>known</u> dimensions for Larsen's new placer claims. Do not attempt geometric calculation of unknown dimensions. See part b. before laying out your sketch.<br><br>b. One year after staking his lease into placer claims, Larsen staked a first tier right limit bench claim in the vicinity of his original downstream legal post for the lease and named it NEW HERB. Draw and dimension this claim on your sketch prepared in part a., or if on a separate sketch, also show its proximity to his earlier HERB claims.<br><br>c. What is a distinct feature of Larsen's ability to stake these creek claims in comparison to the normal provisions that apply to placer claim staking?<br><br>d. With respect to the staking of any creek or bench placer claim, what governs the final location of the claim longitudinally and laterally relative to the position of its legal posts? | 5<br><br>2<br><br>2<br><br>2 | |
| 7 | a. Explain the jurisdiction of the Surveyor General in discipline actions involving the work of Canada Lands Surveyors.<br><br>b. Describe the elements of the customary statement of responsibility prescribed for Canada Lands Surveyors for use with drawings and documents resulting from surveys they have conducted. | 2<br><br>3 | |
| 8 | List the three sources authorized for the naming of features on an official plan. | 3 | |
| 9 | As a Canada Lands Surveyor you have been asked to compile an explanatory plan of a 3.0 metre wide municipal storm sewer easement required across the common rear line of three adjacent subdivisions which were all created on the full extent of the north boundary of an original parcel - Lot 6, Group 854, Plan 42500 CLSR, 21500 LTO, City of Whitehorse, Yukon Territory. That plan showed a bearing of 91°00' for that north boundary and indicated that bearings were referred to the meridian of the southwest corner of the parcel. The boundary was shown to be 20.00 chains in length. No field work is requested, leaving the explanatory plan to be compiled from existing official plans.<br><br>The first and most westerly subdivision adopted the original bearing for the north boundary of Lot 6 and created Lots 21 to 25, Riverview Subdivision having their rear boundaries along it and extending east from the original northwest corner. The resulting plan was recorded as 55000 CLSR, 3000 LTO.<br><br>The second subdivision adjoined the first on its east side and created Lots 90 to 94, Riverview Subdivision and also having their rear boundaries on the original Lot 6 boundary. The resulting plan was recorded as 58000 CLSR, 4200 LTO. It showed bearing 91°12' for the north boundaries of those lots, having derived its bearings from a different recent survey in the vicinity. | | |

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| | The third subdivision adjoined the second subdivision on its east side and created Lots 137 to 142, Riverview Subdivision also having their rear boundaries along the remainder of the original Lot 6 north boundary. That plan was recorded as 61000 CLSR, 5500 LTO and showed the north boundaries of those lots having bearings 91°15'30" referred to the central meridian of UTM Zone 8, 135° west longitude.<br>a. Compile a neat sketch for the body of the resulting explanatory plan assuming any other required information that is not provided.<br>b. Write the bearing statement for your plan and explain your rationale for it. | 5<br>4 | |
| 10 | A major Canadian mining company engages you in 2013 as a private sector Canada Lands Surveyor to assist its exploration group in acquiring mineral claim coverage for an area in the Selwyn Mountains, Yukon/Northwest Territories. The area measures approximately 6 km north-south by 3 km east-west as defined by promising airborne geophysical work and grab sampling on the ground. The rectangular area is approximately centred on the height of land boundary between Yukon and NWT as described in the Schedule to the *Yukon Act*. According to the available topographic mapping at 1:500,000 scale with 500 foot contours, the boundary is in a northerly direction over the area of interest. Roughly 40% of the area of interest lies above tree line. Time is of the essence, both from a standpoint of confidentiality "leaks" and the onset of snowfall at the higher elevations.<br><br>a. In the design of an economical and effective staking program, what legislation will apply to your assignment?<br>b. Draw to an appropriate scale a sketch showing the configuration of claims that you will recommend be staked to ensure that the entire area is acquired. Indicate on your sketch by small open circles the legal posts that will be required for the claims.<br>c. Given that snow slides in the steeper terrain can often sweep legal posts and rock mounds downhill, describe what measures you will take to ensure that evidence of their original locations is preserved.<br>d. Explain in detail how you would determine and accommodate the unsurveyed territorial height of land boundary both during planning and in the field. | 3<br><br>6<br><br>2<br><br>4 | |
| 11 | The Canadian Mutual Insurance Company is the liability insurer for Gateway Amusement Ventures Inc. which stages carnival and midway events in western and northern Canada. Gateway has signed a contract with the Selakwen First Nation to hold a 14 day carnival on its 64.8 hectare Forest No. 10 Indian Reserve near Chilliwack, British Columbia. The official designation of the reserve is SW 1/4, Sec. 22, Twp. 26, E.C.M.<br><br>Before issuing a certificate of insurance for this event, the insurer requires certification in plan form by a Canada Lands Surveyor that the four major mechanical rides proposed to be sited near the southwest corner of the reserve have been installed so that the aerial orbit of each is no closer than 30.0 metres to any adjacent property boundaries or any to adjacent ride. The insurer also requires certification that there are no overhead utility lines within 20 metres of the operating footprint of these rides.<br><br>Two of the rides, Tilt-A-Whirl and Cliffhanger, both have elliptical orbits that extend beyond the footprints of their heavily anchored bases. The other two rides, Carousel and Gravitron, both have circular orbits that do not extend beyond their bases.<br><br>As arranged in advance, Gateway's site manager contacts a local firm of land surveyors to advise that the installation of the rides is complete and that they are ready for a CLS's location certification while the midway concession booths are being erected on the site. The | | |

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| | rides can all be operated in slow motion so that their orbital paths can be determined. The City of Chilliwack electrical inspector has issued an approval for the buried electrical feeds in steel conduits to the four rides and the midway concession booths.<br><br>You are the CLS assigned to this project. You have no difficulty finding and confirming sufficient monumentation along the south and west boundaries of I.R. No. 10 for the purposes of this survey. You determine that all four rides are well clear of the setbacks required and that there are no overhead utility lines in the vicinity of the rides and midway concession booths.<br><br>a. Describe the field work you will have undertaken to complete the requirements for the insurer.<br>b. Neatly prepare a suitable plan to be submitted to the insurer's local agent within two days of completion of the survey so that the insurance coverage can be confirmed before required equipment testing and opening of the event. Assume any necessary information not provided. | 3<br><br>5 | |
| | **Total Marks:** | 100 | |