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the Link MAGAZINE

British Columbia Land Surveyors

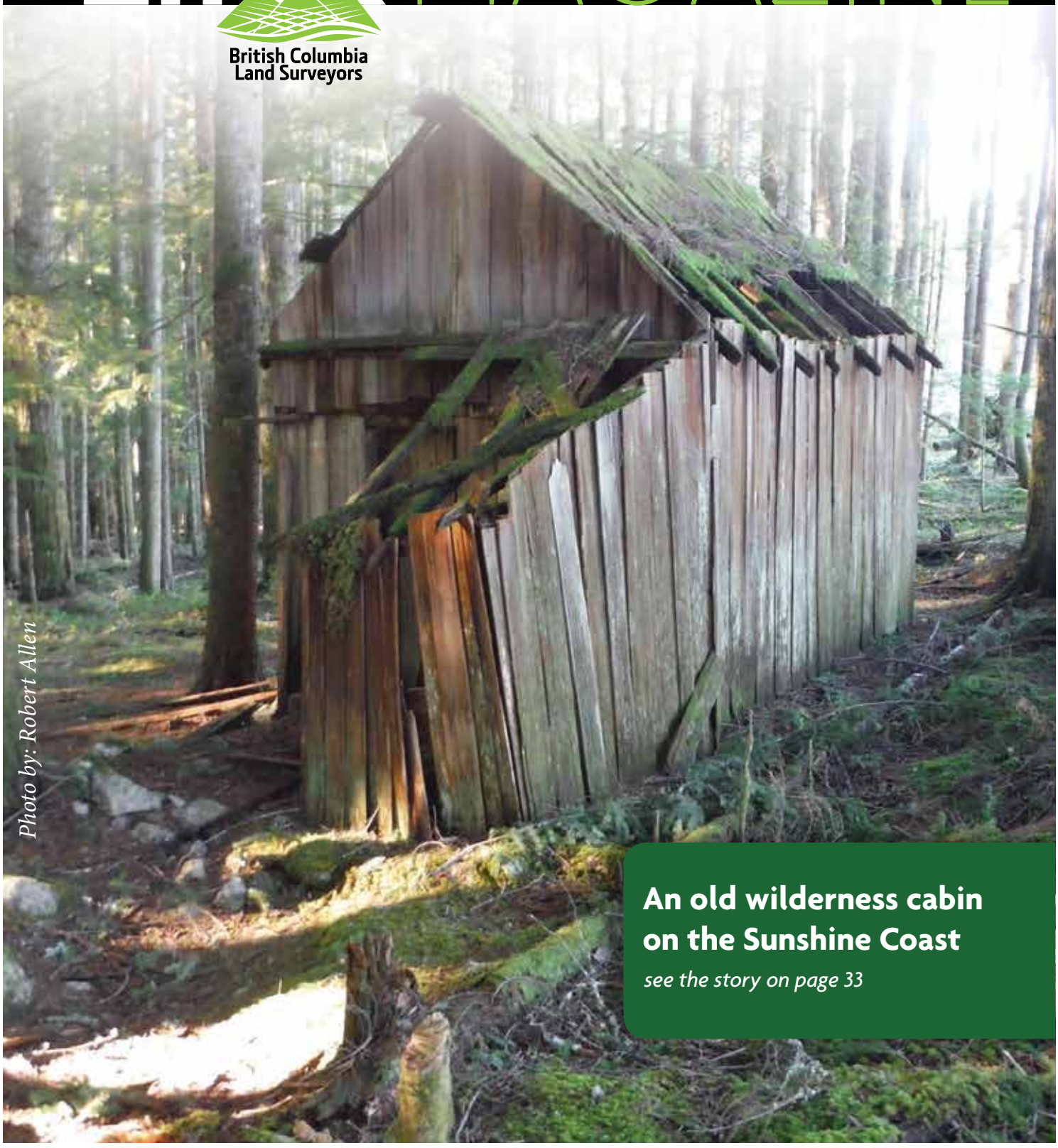

Photo by: Robert Allen

An old wilderness cabin on the Sunshine Coast

see the story on page 33

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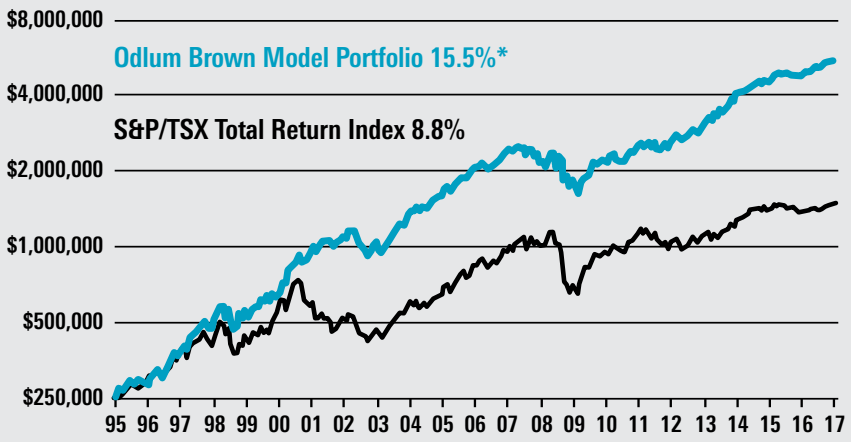

Compound Annual Returns (Including reinvested dividends, as of February 15, 2017) [1]

	YTD	1 YEAR	3 YEAR	5 YEAR	10 YEAR	20 YEAR	INCEPTION [2]
Odlum Brown Model Portfolio [3]	3.5%	21.8%	13.8%	18.1%	9.5%	14.8%	15.5%
S&P/TSX Total Return Index	3.9%	35.4%	8.0%	8.6%	5.2%	7.4%	8.8%
S&P 500 Total Return Index ($CDN)	2.4%	15.4%	17.5%	21.0%	8.6%	7.6%	9.5%

[1] Except for YTD period.

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[1] Except for YTD Period. [2] December 15, 1994. [3] The Odlum Brown Model Portfolio was established by the Research Department in December 1994, with a hypothetical investment of $250,000. These are gross figures before fees. Past performance is not indicative of future performance. Trades are made using the closing price on the day a change is announced. *Compound annual returns are from inception December 15, 1994 to February 15, 2017. Member-Canadian Investor Protection Fund

April 2017

EDITORIAL GROUP

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message from the **President**

Following in the Footsteps

By Brian Browns
BCLS, President

With the deadline for The Link being in the middle of March I'm writing this "President's Message" about a month prior to becoming President at our AGM. This is a new experience.

I am honoured to be your President for this next year and want at this time to recognize all the present and past Board members that I have worked with since the 2012 AGM, elected by our members, in alphabetical order; Steve Buzikievich, Chris Cryderman, Bronwyn Denton, Roger Galibois, David Harris, Nigel Hemingway, Ron Johns, Ian Lloyd, Peter Mueller, Minda Riley, Mike Waberski and Jason Whale. As well as our government appointee, Michael Burian, our Surveyor General Mike Thomson, I've also had the pleasure of working with two Secretaries, Chuck Salmon and Kelly Stofer and of course our CAO Chad Rintoul and the rest of the ABCLS office staff. I have learned a lot from all of them. We have two new Board members that I welcome to the Board, whose identities I don't know yet as I write this in March, but I look forward to working with them and the rest of our current Board. I hope and plan to continue along the path previous Presidents have set out for us.

I am looking forward to our meeting in Victoria, for what will be an interesting batch of CPD opportunities, to once again interact with my fellow land surveyors and to welcome the 18 newly commissioned land surveyors since our last AGM.

I believe we are on track with our recruitment of students into this profession and rewarding career. Since 2007 we have only had one year (2013) where we brought in less than ten new land surveyors. We are averaging almost 15 per year, in contrast with the previous 11 years with an average of less than seven per year. We are the envy of several associations.

Kelly Stofer has settled in well as our Secretary/Treasurer over the last six months, it already feels like he has been doing the job for much longer. We are fortunate to have the team we have in the Association office.

Our Association is relatively small but we are fortunate to have so many engaged members that step forward and volunteer their time, this is one of the strengths of our Association.

The Professional Competency Program (PCP) is continuing to move forward. This is a key program for us to continue to enjoy being a self governing and regulating profession. We are now into the second year of our first three-year cycle of the mandatory CPD component of the PCP. Speaking with land surveyors from other jurisdictions, we are well-respected for our entry level and CPD requirements.

Looking ahead, as you know, the decision has been made on the selection of the contractors to re-write the GSIR, congratulations Chuck Salmon and Brent Taylor, and we look forward to reviewing the document prior to implementation in 2018. This document will also be starting to address Goal #4 in our current Strategic Plan "Enable Utilization of New Technology". We will be formulating a new Strategic Plan in the next few months.

ParcelMap BC is a reality for most of the province and we are becoming used to the requirement of survey plan data set submissions, I certainly look forward to its implementation in the areas that I predominantly work in and being able to reap the benefits it offers.

The 2018 Annual General Meeting and CPD events will be held in Whistler, at the Whistler Conference Centre from March 14th to 16th. I invite you all to mark your calendars and plan to attend. Planning is under way and there are a multitude of available activities with something for everyone, I am sure you will enjoy the meeting and the venue. ✣

message from the **Chief Administrative Officer**

Positive Transitions for the ABCLS

By Chad Rintoul,
Chief Administrative Officer

The retirement of Chuck Salmon in October left big shoes to fill, and Kelly Stofer has done an incredible job of quickly getting up to speed!

The 2017 Annual General Meeting in Victoria is a recent memory for many of us. I want to thank the membership for their broad attendance, support and sponsorship of this event, and acknowledge Ron Johns for his dedication and commitment to the Association during his term as President. He and Marna put many personal touches on the AGM which I know helped make it a very enjoyable event for everyone attending.

Special thanks to the Continuing Professional Development Committee for putting together such an engaging program for the membership attending in Victoria. The early feedback on the CPD program has been very positive - to such an extent that a larger venue would certainly have been beneficial.

The transition to mandatory CPD and reporting has progressed very well in my opinion. At the initial reporting deadline for year end 2016, the vast majority of members had reported on their CPD credit hours, and it appeared that 82 practicing members had not input any CPD for the first year of the program. The members who had not reported CPD were contacted to address this deficiency, and in some cases we found anomalies such as some individuals having two profiles (one profile established by ACLS and one by the ABCLS). In correcting those issues the non-compliance rate dropped to approximately 15% of members, and on notification many Land Surveyors quickly set out to input their 2016 CPD. Overall, given that this is the first reporting cycle, I am very impressed with the diligence British Columbia Land Surveyors have shown in complying with the program, and I thank the membership for embracing this aspect of the Professional Competency Program.

At the AGM I noted that the Sidney office had experienced significant changes in staffing. The retirement of Chuck Salmon in October left big shoes to fill, and Kelly Stofer has done an incredible job of quickly getting up to speed! Kelly has been a pleasure to work with, and clearly the Board did an excellent job sifting through some very well qualified applicants to select Kelly for this position. Vicki Pettigrew also retired recently, and is missed both as a friend and valued co-worker. Vicki was always enjoyable to work with and extremely dedicated to the Association, and I wish her all the best in retirement. Vicki has been kind enough to come back on occasion to help us in the planning of the AGM, and also to provide orientation to Bev Renny, our new Administrative Coordinator. It definitely feels like Bev was thrown to the wolves with AGM planning in mid-stream, and I certainly appreciate that both staff and members have made Bev feel welcome.

Much of the focus outlined in the Strategic Plan for 2017 will be on a rewrite of the General Survey Instruction Rules. To that end, a GSIR Work Group has been established, including members and stakeholders, to participate in a process being led by contractors Chuck Salmon and Brent Taylor. Both Kelly Stofer and I look forward to working with them in the year ahead.

By June of this year the Board will be focused on the next planning window as we develop the 2018 - 2020 Strategic Plan. The process will include opportunities for members, stakeholders and the public to provide insight on future priorities to be addressed by the Association. A couple of operational areas I hope to see addressed in the next planning period will be the ABCLS committee structure and

the introduction of 'term limits' for committee participants and board members, as well as a review of the current practice of selecting AGM locations and formats on an annual basis. I believe there are alternatives we should consider which could make the AGM less time consuming for participants and less costly for the Association while fully addressing our professional obligations, consultation with members, and still allow for social opportunities to network and enjoy the company of colleagues and friends.

Finally, my thanks to the ABCLS Board. This dedicated group puts in a tremendous amount of time and effort for the benefit of the public interest and this profession. As a self-governing profession there is a perspective to be maintained by this Board that is of paramount importance, and they carry this work out diligently. I look forward to working with our new President, Brian Brown, in the year ahead. ✣

DELEGATE REPORTS

Land Surveyors Association of Washington Annual Conference

By Brian Brown, *BCLS, President*

The Land Surveyors Association of Washington (LSAW) held their annual conference March 8 - 10, 2017 at the Hilton Conference Center in Sea-Tac, Washington. The meeting opened on the Wednesday morning with a plenary session titled Anyone Could Lead Perfect People with of course the proviso "but there aren't any!".

This was an interesting conference to attend partly for the contrast to our AGMs. Land surveyors in Washington, and in fact most states, do not enjoy the realm of self governance and regulation, rather they are licensed by the state. Another contrast was scale, there are over 1,500 in the LSAW with about 1,000 of them licensed Land Surveyors. I believe there were less than half of them attending.

The actual business meeting portion was covered at lunch on the first day. The incoming officers are introduced and there were a few questions from the floor, this all took place after lunch on the first day.

The vast majority of the conference is a series of CPD events. Wednesday afternoon the presentations offered (all running from 1:30 pm to 5:00 pm) were: Surveyor in Court (I chose this one for myself), Aquatic Boundaries, Legal Descriptions, NGS Opus Projects Overview, Professional Liability Insurance and WCCS and NACS Joint Meeting. They had their Grand Opening Reception on the Wednesday evening. Thursday morning (again all running at the same time 8:00 am to noon) Surveyor's Judicial Role (I chose this), CFEDS – Subdivision Fractional Sections, these first two also continued in the afternoon, FEMA Workshop, NGS Update, WGS & WSRN Update, GPS & Plate Tectonics, 30 Minute Case Studies (a series of them, continued in the afternoon), Deformation Monitoring, and then in the afternoon from 1:30 pm to 5:00 pm, GIS for Surveyors, Young Surveyors Meeting (I did not attend) as well there were a series of mini seminars aimed at their LSIT's, yes LSIT, they add one letter from what we have. On the Thursday evening, they have their Annual LSAW Awards Banquet which is when the new Officers are actually inducted and the new President takes the gavel. Friday was more CPD all day (same time slots), I attended the one called Future of Land Surveying, very thought provoking. It is also interesting the way they track their CPD. At the start of the conference there is a booklet available for pickup that acts like a program for the conference, in the middle there is a form that when leaving a CPD session they get a stamp for that session. It is up to the Surveyors to keep track of their own CPD and can produce proof if requested, they have a requirement of 15 hours per year.

Thank you to now Past President John Christensen for his hospitality and congratulations to President Carla Meritt. ✣

National Surveyors Conference - Ottawa

By Ron Johns, *BCLS*

"The Cornerstone of a Country"

The National Surveyors Conference was held from February 28th to March 2nd, 2017 in Ottawa. To coincide with Canada's 150th Birthday, the meeting was jointly hosted by the Association of Canada Land Surveyors, Ontario Land Surveyors and the Ordre des Arpentures-Géomètres du Quebec. The venue for this tripartite meeting was the Shaw Centre in downtown Ottawa. Many BC Land Surveyors were in attendance.

The ACLS and AOLS both conducted their AGM's during the conference. Joint CPD sessions, workshops and social events were held, in which all three associations participated.

The ACLS AGM commenced on the morning of February 28th and was officially opened by President Tania Bigstone. Tania recapped the year's accomplishments including hydrographer certification, a new ACLS website, CPD reporting and GeoEd enhancements, assistance to sister organizations and the recording of ACLS processes and corporate knowledge. Work continues on funding for the Foreign Credential Recognition program which will be a 'one stop shop' for accessing qualifications. A cost study and capacity study for work performed by CLS's has started.

JC Tétreault, executive director, reported that there has been a slow decline in membership numbers since 2010, however there is a slight increase in the number of candidates in the system. There was one complaint in 2016 and that matter will be heard in April. GeoEd is very popular and there are over 130 courses now available. Ontario will soon become a user of the CPD reporting tool. He concluded with the treasurer's report and budget for the upcoming year.

Akbar Karsan, Land Surveyor, read a Mayors Proclamation making March 1st "Land Surveyors Day" in Ottawa.

The Surveyor General for Canada, Peter Sullivan, ALS, CLS, MBA reported on various undertakings. A new website for the International Boundary Commission is now available and he encouraged everyone to visit the site. He updated the membership on the survey contracts that have been awarded and upcoming projects that will require CLS involvement. The Surveyor General Branch issued 96 contracts last year with a value of $2.5 million. He expects that treaty work in BC will increase and that Comprehensive Land Claim work 'north of sixty' will become significant soon. He forecasts that 200 to 250 survey contracts per year will become the normal with a value of $4.5 to $5.5 million per year. The Precise Point Positioning tool is being used globally and the new "Real Time PPP" is seeing many uses, including early warning detection for earthquakes and tsunamis.

The committee reports were made available in the annual report and nothing further was added from the floor.

A detailed Practice Review Department report was given by manager Julia Meldrum-Smith. Most of the reviews last year took place in the Atlantic Provinces. She noted that survey field notes were often lacking in detail and reminded members of the key features that they should contain. She also reminded members of the proper use and security of digital signatures.

The report by Wilson Phillips, Chair Professional Surveyors of Canada, was substantially the same one he presented in New Brunswick (see that report in this Link issue). He did inform the membership that there are some conflicts with the use of the P.Surv designation in Saskatchewan. That term is imbedded in Saskatchewan legislation and refers to expanded professionals who are not registered

A detailed Practice Review Department report was given by manager Julia Meldrum-Smith. Most of the reviews last year took place in the Atlantic Provinces. She noted that survey field notes were often lacking in detail and reminded members of the key features that they should contain.

Land Surveyors. It appears that PSC may have to reconsider pursuing the P.Surv trademark initiative.

The ACLS vice president stepped down a few months ago. Tania agreed to serve a second term as president and Dominique Fecteau offered to let his name stand for vice president. Both were elected by acclamation. Doug Dodge, BCLS,CLS was elected as a councillor.

Some minor bylaw amendments were presented. A fee increase bylaw generated a fair bit of discussion.

There was no new business and the meeting adjourned at 4pm. The 2018 AGM will be in Victoria from March 26th to 29th and will be held in conjunction with the Canadian Hydrographic Association Conference. The 2019 AGM will be in Halifax in May of that year.

Opening Ceremonies were held on March 1st following CPD seminars and a welcoming reception that evening. Dr. Brian Ballantyne's session was "Contribution of Surveyors to the Development of Canada" in which he spoke on how surveying has shaped and continues to shape Canada. He detailed many scenarios to illustrate his points and stated that surveyors are the "agents of change".

The next presentation showcased how Parks Canada, Fisheries and Oceans and the Canadian Hydrographic Service teamed together to locate the wrecks of HMS Erebus and HMS Terror. This fascinating story included discussions on the role of hydrographic surveying and its relevance to underwater archaeology.

The Keynote speaker was Natalie Panek. She delivered a powerful speech titled "Revolutionizing Women in Technology". She cited perseverance, embracing failures, working outside of comfort zones, patience and mentorship as being keys to success. She is currently working toward her goal of becoming an astronaut.

The final session of the day was a Loss Control seminar presented by a number of people involved in the liability insurance industry. The material examined common errors, claim scenarios, financial impacts on surveyors and clients. Elevation errors tend to make up a large number of construction related claims. Surveyors were reminded to have as many redundant checks as possible when doing construction related surveys. The AOLS insurance plan is partly self-funded which allows for profit sharing to take place based upon good claims records. This year $85,000 in premiums were refunded to Ontario Land Surveyors, proportional to the individual premiums paid.

CPD seminars continued on May 2nd, along with a Convocation Lunch and President's Dinner and Dance that evening. The morning CPD session was an informative and emotional presentation on the Fort McMurray and Lac Megantic disasters. The Fort McMurray fires resulted in the evacuation of over 88,000 persons. The speaker, a land surveyor from that area, spoke on the challenges of reconstructing the cadastral fabric in areas where virtually all survey evidence was destroyed by the fire and subsequent reclamation work. In some cases surveys are being done under a section of the Alberta Land Surveys Act that allows for new surveys to be done and old posts found afterwards no longer govern.

In Lac Megantic, one third of the population of 2,000 were evacuated and 47 lives were lost. The speaker acknowledged the contributions of surveyors throughout the clean-up and rebuilding phases. A new commercial hub needed to be created nearby until businesses could return to the affected area. Once cleanup was completed the area was the subject of a re-plot to accommodate a more efficient layout for the new downtown core. The entire underground infrastructure needed to be replaced due to contamination. These projects, in addition to developing a new railway corridor to bypass the downtown, have required much involvement from the survey community.

The second morning session was titled "The United Nations Convention of the Law of the Sea and Canada's Submission". The presenters discussed the various boundary limits and the concept of the "extended continental shelf" beyond the 200 nautical mile limit in the Atlantic and Arctic oceans. New delineations in the Atlantic Ocean will lead to Canada having jurisdiction over an additional 1.2 million square kilometers of ocean bottom. Research and surveying continues in the Arctic to define the limits of the continental shelf. Complexities of surveying in the remote and harsh environment made for an interesting presentation. The aim is for Canada to make a submission to the Limits Commission by 2019. It is expected that there will be overlaps with the other countries who border the Arctic Ocean. The goal is to define Canada's last international boundary.

The Convocation lunch included the presentation of 14 OLS commissions and one CLS commission, in addition to recognizing recipients of various awards, including the David Thompson National Geomatics Awards.

Following lunch, Jean-Francois Dalbin from France discussed the GeoFoncier

portal. This software provides a single window for all geographic information in France, including legal survey layers and high resolution aerial photography. There is also a requirement for utility providers to enter as-built information for all new underground services.

The final session was a thought provoking presentation on property rights. Despite a United Nations Declaration regarding rights to own land, only one quarter of the world's population actually have that right. Only 2% of land rights are owned by women. The speaker identified corruption and lack of capacity for third world countries to develop and maintain land registration systems as global barriers to land rights and ownership. He suggests that the best solution for global property rights would be a "common and universal cloud platform registry system".

I attended the Ontario Land Surveyors AGM which was held on the morning of Friday, March 3rd. An ACLS Technical session was also held during the same time period.

President Murray Purcell opened the short business meeting with the ceremonial presentation of the "Standard Measure". This is a very old graduated steel bar that is placed near the podium while the meeting is in session. Approximately 200 members were present at the meeting. Election results were announced. The incoming president is Russ Hogan and Dan Dzaldov was elected VP by acclamation.

The Surveyor General for Ontario, Sue MacGregor, OLS, presented her report. Ontario is very similar in size to BC and has roughly the same percentage of Crown Land. The Office of the Surveyor General is responsible for administering surveys and preserving records for Crown Land. They are currently involved in a project to scan all survey records dating back as far as 1730 for access by future generations.

The registrar reported that there are currently 470 licenced surveyors and 84 articled students. Ten complaints were dealt with last year.

Activities of the Ontario Digital Cadastre Corporation (ODCC) were summarized. The ODCC is a wholly owned subsidiary of the AOLS. Surveyors submit subdivision plans voluntarily and receive a nominal payment for each plan submitted. The information is stored on a province wide data base and is made available for a fee to various users. The Ontario Property Assessment Corporation is one of the larger clients of the ODCC.

As the senior travelling delegate, I thanked Murray on behalf of the delegates and the Association of BC Land Surveyors for serving his term as president and for his valuable contributions at the President's forums.

After a brief open forum, the meeting was adjourned. The next meeting will be at Niagara Falls in February 2018.

I would like to thank Murray Purcell, Sophie Morin, Tania Bigstone and Jean Claude Tétreault for hosting this conference and for the hospitality that was extended to Marna and I. It was obvious that a tremendous amount of planning went into this historic event and the opportunity to collaborate with so many surveyors from across Canada was a rewarding experience.

Here's a link to the opening ceremony in Ottawa. *https://www.youtube.com/watch?v=_NWqwEaWiDU* ✣

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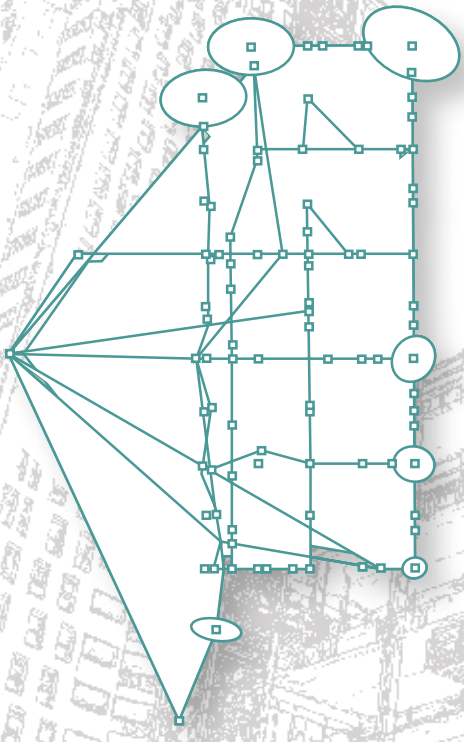

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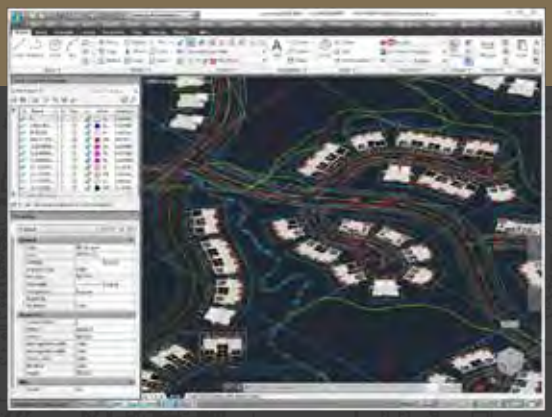

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Association New Brunswick Land Surveyors

By Ron Johns, *BCLS*

The 64th Annual General Meeting of the ANBLS was held in Moncton on January 19th to 20th, 2017. The President's Forum was held on the evening preceding the meeting. The turnout was 100%, with all provinces, ACLS and PSC represented. Concern was expressed regarding the elimination of the Manitoba Director of Surveys position. Newfoundland also reported that their Director of Surveys has retired and a non-Land Surveyor is acting in that role. The group will explore ways to ensure surveyors have a voice inside government. Jean-Claude Tétreault, CLS, a.-g., MBA, provided an update on CBEPS activities. He spoke about the Foreign Credential Recognition Initative and a new program aimed at providing high school counsellors with a document to describe to students the education requirements for our profession. This will likely be in the form of a webinar for grade 10 guidance counsellors and teachers. The forum ended with round-table discussions, where each of the presidents recapped current events at their associations.

Newfoundland also reported that their Director of Surveys has retired and a non-Land Surveyor is acting in that role. The group will explore ways to ensure surveyors have a voice inside government.

Thursday morning included a welcome speech from the Deputy Mayor, introduction of guests and exhibitors and a Loss Control seminar presented by Mark Sampson of Arthur Gallagher Canada. Mark noted that title claims make up about 90% of the claims in the eastern provinces, while in the western provinces 90% of the claims are construction related. Mark's seminar was followed by a presentation by the Director of Surveys for New Brunswick, Mr. Joey Chessie, NBLS. His department is responsible for survey control and administration of all legislation pertaining to surveys in the province,

in addition to acting in an advisory capacity for survey related matters. As of May, the various Land Registry Offices in the province will be consolidated into a new single office to be located in St. Stephen.

Two seminars were offered in the afternoon. The first was a very detailed presentation on NRCAN's Precise Point Positioning tool by Dr. Marcelo Santos. He discussed the strengths and weaknesses of the system and some of the errors inherent in the resulting co-ordinates. He indicated it will never be as accurate as RTK and that a minimum of two hours of data should be obtained to achieve a reliable position. Results are available within minutes of submission and accuracies in the two centimetre range can be expected. The second seminar was titled "Are Surveys Obsolete" by Bob Aaron. Mr. Aaron practices real estate law in Toronto and is known for his Toronto Star column. Since May 2000, he has written over 600 articles in the 'new homes' section of that publication. He outlined a variety of court cases across Canada in which the evidence showed that had a proper survey been done, the damages could have been mitigated or the cases could have been avoided altogether. He also provided a number of examples of individuals relying on title insurance where there was no compensation awarded for loss claims due to a variety of indemnity clauses in the policies. He claims that a current survey is the single most important document in any real estate transaction.

The icebreaker social on Thursday evening was well attended. Tables participated in a trivia contest that was both entertaining and challenging. Interestingly, the tables that had survey students seemed to do especially well.

The business meeting commenced on Friday morning with the ceremonial "Marching of the Mace". The mace resembles an ornate square wood survey post and is placed next to the podium while the meeting is in session. 45 members were present at the meeting. The voting membership totals 111 and includes life members and retired members. 63 members are on the current active list.

The "Joint Office Efficiency Study" was the first item on the agenda. Being a smaller association, the burden of administering their affairs puts a strain on the limited number of volunteers. Discussions were held with the Association of Professional Engineers and Geoscientists of NB (APEGNB), the Association of PEI Land Surveyors and the ACLS. Most provincial Presidents, including myself on behalf of BC, expressed concern with merging with APEGNB. PEI has similar issues with costs associated with managing a small association and are working toward a support agreement with the ACLS. The ANBLS executive directors' positon has been vacant for two years. Council recently voted to fund and advertise for a new ED. It is hoped that this will take some pressure off the volunteers. Council has recommended taking a 'wait and see' approach before further exploring outside help.

The NB Government has mandated that Professional Associations must provide services to members in both official languages. There are currently only two bi-lingual persons on their council. One of the challenges identified is if a member requests that a discipline hearing be conducted in French.

Five complaints were received from the pubic and all were handled effectively and resolved.

The ANBLS is hopeful that a new Land Surveys Act will be proclaimed this spring. An interesting provision in the proposed Act was required by government for it to be successful. It will allow land surveyors in good standing from other provinces to apply for and become New Brunswick Land Surveyors without examination.

An initiative to move toward digital plan submissions was discussed. Government contracting of services was also discussed. Unlike the situation in Nova Scotia, where the land surveyors were not notified of a possible privatization of the Land Title Office, the ANBLS has a strong relationship with the Director of Surveys and good lines of communication with those responsible for alternate service delivery initiatives.

Mark noted that title claims make up about 90% of the claims in the eastern provinces, while in the western provinces 90% of the claims are construction related.

At the awards luncheon, 35 year service awards were presented along with several certificates of appreciation. Although no new commissions were presented, it was noted that there are currently 11 survey students enrolled.

JC Tétreault delivered a report on behalf of CBEPS. He noted that 81 Certificates of Completion were issued last year, being an increase of 25% over the previous several years. The CBEPS accreditation team has been working with York University and it appears likely that institution will become fully accredited this spring.

Wilson Phillips, MLS, CLS reported on PSC activities. He touched on the three position papers that have been published, the professional liability insurance program and direct advocacy to Government. PSC now reports quarterly to members, responds to inquires within one day and offers service in French and English. The advertising campaign project has resulted in 14,000 visits to the PSC website as a result of "click through" pop up ads on CBS news and Facebook sites. PSC continues to work on the P.Surv designation trademark and the underground infrastructure mapping initiative.

Five vacant council positions were elected by acclamation including Jaret Guimond for Vice President. Dave Parkhill agreed to run as President for a second term and was also elected by acclamation.

The advertising campaign project has resulted in 14,000 visits to the PSC website as a result of "click through" pop up ads on CBS news and Facebook sites. PSC continues to work on the P.Surv designation trademark and the underground infrastructure mapping initiative.

In the new business session a vote was held to approve an "all in" model for PSC membership and to include the PSC dues in the general membership dues. Although this received unanimous support, an official charge levy bylaw will be presented at a later date for ratification by the membership.

A motion to recover the costs of all Association CPD seminars in a given year by invoicing all practising land surveyors was passed.

The senior provincial delegate, Murray Purcell, OLS, thanked Dave for his time served as President and for his contributions to the Presidents Forum.

The President's Ball was held on Friday evening with entertainment and dancing.

The 2018 AGM will be held in St John.

I would like to thank Dave and his partner Beth for their wonderful east coast hospitality. Marna and I enjoyed representing BC and participating in the AGM events. ✣

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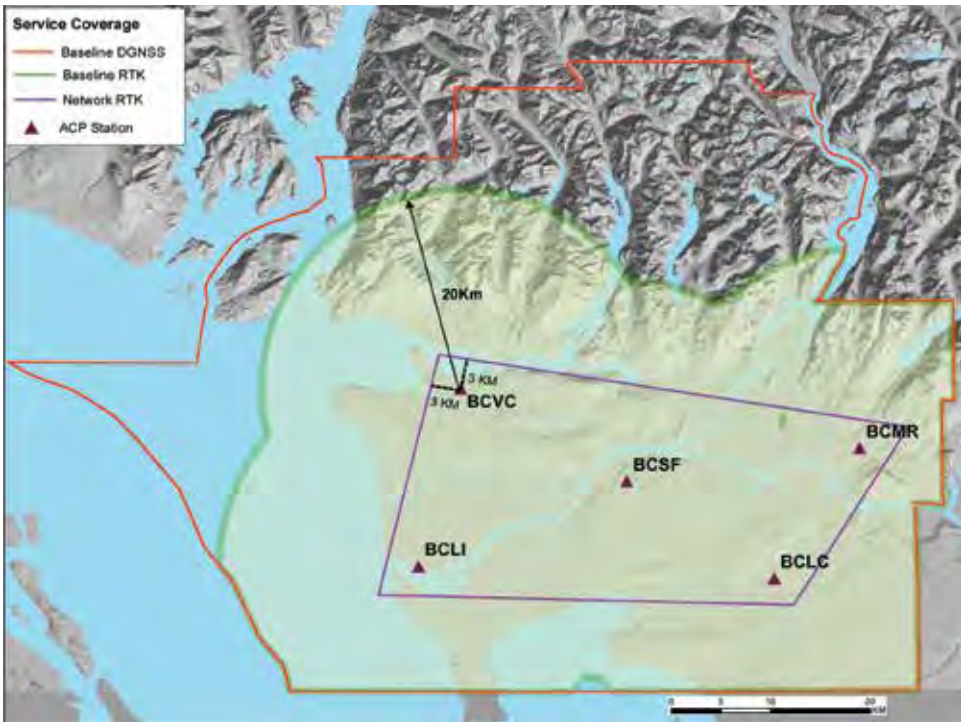

BC Land Surveyors using these integrated ACPs will comply with the General Survey Instruction Rules (GSIR), as established by the Association of BC Land Surveyors (ABCLS), for georeferencing or integrating legal surveys within the region.

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OIP Luncheon

Submitted by: Wayne Griffith, *BCLS (ret), CLS (ret)*

Front row left or right: Ralph Turner, Clare Hobbs, Keith Errington, Rick Clendenning, Ron Scobbie, Neil Bennett and Bill Chapman. Middle Row left to right: Dick Mak, Don Watson, Chris James, Larry Achtemichuk, George Fenning, Don Black and George Robertson. Back row left to right: Martin Schulze, Robert Allen, Jay Sherwood (guest), John Nash, Wayne Griffith, Dave Liddle, Dai Yates, Alan Comfort and Brian Brown. *Photo by Dick Mak*

The OIP Group met on Monday January 9, 2017 at the ABC Country Restaurant in Surrey. Despite the inclement weather over the weekend, 22 surveyors and one guest were in attendance. Due to snow and ice conditions in Chilliwack, Stan Nickel and Paul Penner missed the luncheon. We look forward to seeing these gentlemen at our next luncheon.

For our first order of business, Robert Allen introduced his guest Jay Sherwood. Jay is the author of seven BC history books and he was promoting his latest book called Ootsa Lake Odyssey. This is the story of George and Else Seel - A Pioneer Life on the Nechako Watershed. Jay Sherwood is currently working on a book about the survey of the Alberta - BC border and we wish him well in this important endeavour. The LTSA have commissioned Jay to write this book and it should be a very interesting read when completed.

While we were waiting to order lunch, Dick Mak assembled the fellows for the 2017 group photo. Wayne Griffith then introduced Brian Brown and Alan Comfort as newcomers to the

Left to Right: Don Black, Brian Brown, Wayne Griffith and Alan Comfort
Photo by Dick Mak

luncheon. Both fellows had a fair commute to join the luncheon with Brian travelling down from Whistler and Al coming over from Roberts Creek. Brian is now without his signature beard and he has joined McElhanney Surveys as a Project Land Surveyor. Alan has retired from BC Hydro and is dabbling in restoring old motorcycles from his retirement home at Roberts Creek.

Neil Bennett gave the group a brief report on Doug Meredith who recently turned 88. Doug has been in the hospital with some serious health issues. The OIP Group wish Doug a speedy recovery and we hope to see him at future luncheons.

There was no shortage of laughs at the table with Ralph Turner opening the humour portion of the luncheon. Clare Hobbs, Martin Schulze, Dai Yates and Keith Errington all contributed to the lighter side of the luncheon. The ABC Restaurant took good care of us and after some great fellowship we said our goodbyes and headed for home around 1:30 PM.

Our next luncheon will tentatively be on Monday, May 1, 2017 at the same location. If you would like to get on the OIP Group email, to receive luncheon notifications, contact Wayne Griffith at wmgriffith@shaw.ca. ✣

Robert Allen left with author and retired teacher-librarian Jay Sherwood
Photo by Wayne Griffith

Submitted by:
Secretary OIP Group
Wayne Griffith, BCLS (ret), CLS (ret)
Email: Wmgriffith@shaw.ca
Phone: (604) 807-1337

Surveyor General's Datum

Land Title and Survey Authority of British Columbia (LTSA) Update

By Mike Thomson,
Surveyor General

This article is based on the report of the Surveyor General to be delivered April 6, 2017 as part of the 112th Annual General Meeting of the Association of British Columbia Land Surveyors in Victoria, BC

Introduction

A brief update on activities at the Land Title and Survey Authority, with a specific focus on the Surveyor General Division.

The Land Title and Survey Authority (LTSA) of British Columbia is a publicly accountable, statutory corporation responsible for operating British Columbia's land title and survey systems. The LTSA is established as a regulatory authority, independent from government, with the mandate to "manage, operate and maintain the land title and survey systems of British Columbia."

Reliable and secure land title and survey systems are an essential underpinning to BC's private property market and civil justice system. These systems also support civic governance, taxation and Crown land management frameworks.

The LTSA earns its income from a portion of the service fees it charges customers (other than the Provincial government, which is fee-exempt). Its net earnings, achieved through prudent financial management, continue to be re-invested to achieve land title and survey public policy objectives and sustainable, cost-effective operations.

In fiscal 2015/16 the LTSA processed about 3.9 million online transactions, 21% for the registration of land title interests and approximately 79% for searches of registered records and issuance of certificates.

The LTSA consults with stakeholders to deliver efficient, sustainable, cost effective operations and prudent financial management. The LTSA is an efficient and progressive organization that enjoys excellent customer trust and satisfaction

2016 Year in Review:

In 2016 we saw the 5 Millionth document registered electronically and the 1 Millionth survey plan deposited in the land title office. We introduced the electronic delivery of 'State of Title Certificates', a significant improvement for the conveyancing community. We saw expansion of our Tax Certificates On-line service, a launch of the improved Parcel Activity Notifier and introduced an enhanced Scan on Demand service for records in the Surveyor General's vault.

We recorded our single busiest day on record - July 29, 2016 - with some 9,270 applications received. The system handled over 54,000 searches and 229,000 related transactions that one day. This level of activity was being driven by the pending introduction of the additional 15% foreign buyers Property Transfer Tax (PTT) in the Lower Mainland.

By the end of 2016 the parcel fabric for 22 of 29 Regional Districts was available in ParcelMap BC and under on-going maintenance by our ParcelMap BC Operations team. Two more regional districts were available by the end of January 2017; four more will be on line before the ABCLS AGM starts. This leaves only the Greater Vancouver Regional District outstanding. It will become available in 3 increments over the next 3 months.

We completed a customer survey in the fall of 2016. We achieved an overall Satisfaction rating in the LTSA of 93% and an overall Trust rating of 97%. Very satisfying results.

In November 2016 we formally kicked off our new project, Project ACE, or Advanced Customer Enhancements being the LTSA's next major technology upgrade. Again, I will describe Project ACE in greater detail later.

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As we enter a new fiscal year, starting April 1, 2017, I note one very important event that should be on the calendar for all land surveyors, but particularly those in the Lower Mainland.

As part of the CPD session at the Lower Mainland Group meeting on June 1, 2017 Kelly Stofer, the ABCLS Secretary, Gord Gamble, the Practice Advisory Manager and myself will be presenting a seminar on recent trends in the survey industry, particularly as it relates to posting plans for new housing. There is a risk that a small portion of the profession has lost touch with the purposes of boundary re-establishment and the role of the land surveyor. I would encourage all land surveyors, but certainly all in the Lower Mainland to attend this important session on June 1, 2017.

Organizational Changes

Over the last year we experienced some reasonably significant staff changes at the LTSA, most of those early in 2016. Recent months have been a little steadier on the human resources front.

A couple of notable exceptions were the loss, in the Surveyor General Division, of our Surveyor General Services business unit lead Terry McDonald. Terry is now a client of ours, working for the Ministry of Forests, Lands and Natural resource Operations, within Crown Land Administration. As a result we have a fairly young team supporting land surveyors within our group of SG technicians.

Jeff Beddoes, Cristin Schlossberger, Dave Swaile, Peter Haas and Katie Hannah remain available to serve you as Deputy Surveyor Generals. As we have mentioned, we are on a slow exit, long-term retirement plan for Jeff. Jeff will work approximately 60% of the time over the next year. I am very comfortable with the level of service and support that our fine group of young professionals is able to deliver. We appreciate the on-going support and cooperation of the land surveying community.

Our CEO and President Connie Fair and her husband John Savage will attend the President's Dinner April 7th and the Director of Land Titles; Craig Johnston, will be at the lunch April 6th.

While Bert Hol and O'Brian Blackall continue as ABCLS nominees to the LTSA Board, the Board Chair, Geoff Plant's term came to an end on March 31, 2017. The Board has named a new Chair, Janice Comeau a nominee of the Province. Janice was originally appointed to the LTSA Board in 2011. Scott Smythe a lawyer with McCarthy Tetrault a nominee of the Law Society of BC has taken Geoff Plant's seat on the Board.

I should acknowledge and congratulate O'Brian who was appointed to an additional 3 year term April 1, 2017 to March 31, 2020.

Before I move on I would like to congratulate Kelly Stofer on his appointment as Secretary. Kelly is doing a great job, and is simply one of those people that would be great in any role he takes on.

LTSA 2016/2017 Year to Date

Notwithstanding our 2016/17 fiscal year came to an end Friday, March 31, 2017, I only have financial information that takes me to the end of January, 2017 or the first 10 months of the fiscal year.

The land title office, in particular, has had a very busy year although activity has settled closer to statistical averages the last few months. Measured against anticipated revenue, core business, to the end of January was 15.1% above expected activity levels. Note, however, in December 2016 we saw revenues 5.7% above budget projections but some 0.8% below December 2015 revenue. January itself came in at 12.3% total revenue above anticipated levels and 4.1% above January 2016 levels.

In the Surveyor General Division (through 11 months):

- Through the first 11 months of fiscal 2016/17, 84 Crown grant requests were received, identical to the 84 in the same period in fiscal 2015/16.
- Through the first 11 months of fiscal 2016/17, 933 Crown land survey plans were received, down 38% (564) from the 1,497 plans to the same point in fiscal 2015/16. The number of Crown land survey plans received each month has been quite low for the last 8 months. Probably no surprise for those that work in the oil patch.
- Through the first 11 months of fiscal 2016/17, 318 statutory applications were processed, up 21 (7%) from the 297 to the same point in fiscal 2015/16.

The Surveyor General Division continues to see a heavy focus on First Nations treaty settlement matters in our daily business. The Province, Canada and First Nations all remain very active in moving forward with Incremental Treaty Agreements

Electronic Survey Plan System – Land Titles Update

- 2015 saw the first month, September, where we achieved 100% electronic filing of land title

office plans. To the end of February, 2017, 99.8% of the plans filed this fiscal year to the land title offices have been received electrically. That means only 17 plans have come in on mylar. I am thinking by the end of next fiscal, in March 2018 we will have seen the last of the mylar plans coming out of land surveyors offices.

- The total of 9,461 survey plans filed in the first 11 months of the fiscal year represents a 3.5% (339 plans) decrease from the 9,800 plans in the same 11 months in fiscal 2015/16.

ParcelMap BC Overview

We are approximately 12 weeks away from having achieved a single, complete, trusted, and sustainable map of all titled and surveyed provincial Crown land parcels. Our vision for ParcelMap BC, as a single source cadastre for BC, is almost complete. At present 28 of 29 Regional Districts are mapped and in our operations environment. That will leave only the Greater Vancouver Regional District to complete. We have broken the area into 3 increments as follows:

Increment A, being south of the Fraser River and containing Surrey, Delta, White Rock, Langley Township, Langley City and Tsawwassen First Nations, compilation is complete, and the increment is currently undergoing acceptance testing by the LTSA. We hope to be able to publish it by the end of April.

Increment B covering Richmond, Coquitlam; Port Coquitlam, Port Moody, Maple Ridge, Pitt Meadows, North Vancouver District, North Vancouver City, West Vancouver, Bowen Island, Lions Bay, Belcarra, Anmore, Electoral Area A, except UBC , compilation of missing parcels is complete, and we are on target for LTSA acceptance on April 28, 2017. Increment B should be published by the end of May, 2017.

And the final Increment; Increment C representing New Westminster, Burnaby, Vancouver and UBC Endowment Lands compilation is complete and we are moving towards factory testing of the built fabric. We are targeting LTSA acceptance at the end of May, 2017 with integration into the published fabric by or soon after June 30, 2017.

You may also remember that we expanded the scope of the project with the decision in November 2015 to map some 4,377 statutory rights-of-way plans over Crown land – in the Peace, oil and gas statutory rights-of-way that were not contained within the source Crown SRW layer obtained from the Province. We completed the integration of those 4,377 right-of-way plans into the fabric in early March, 2017.

The LTSA has decided to proceed with a project to provide land title attribution (PID numbers) to between 17,000 and 18,000 Crown land right-of-way segments that did not have the attribution in the source data. This is additional scope, that the LTSA felt was important to PMBC users.

As you know land surveyors have had access to Surveyor Search and Download since April 22, 2016 and our other professional customers have had access to the ParcelMap Information Search through myLTSA since August 19, 2016. Land surveyors for the most part are doing a good job of ensuring that your obligation to submit Survey Plan Datasets is being met. We wish to remind all that one of the critical pieces is that the dataset must be submitted prior to the plan being fully accepted and registered by the land title office, or confirmed by the Surveyor General.

We do note that we have a significant backlog of approximately 860 datasets that are missing. Our ParcelMap BC Operations team is working through the backlog and I thank everyone for their support and cooperation. Once we get through the backlog we can start to concentrate on meeting our target turnaround time for integrating new plans. This component, the Survey Plan Dataset, is critical so that we may integrate the new information into the fabric as soon as possible thereafter. Additionally the on-going georeferencing of surveys is building up a strong war chest of cadastral ties that will allow us – once the build is complete – to start an on-going program of accuracy improvements.

The ParcelMap BC project has been an exciting one and while we near the end of the original build phase it is important to recognize that it really never ends. Each day there is changes to the cadastral fabric of the province that need to be mapped. We will soon start to consider enhancements to the fabric and the system including things like access to plan preview through the ParcelMap BC application. We did announce last week some enhancements improving access to ParcelMap BC, such as better usability for ParcelMap BC on mobile devices, and historic searches through PMBC. We must however remember that 'history' only goes back to when a particular section of the fabric was made public.

I wish to express my thanks to the members of the Land Surveyors Advisory Task Force, who have contributed so much to the project and

left us with a set of ideas and thoughts for future enhancements. We have made some changes to the members of the task force with Ivan Ngan, Ron Johns, Chad Rintoul and Chuck Salmon stepping off and Tracey Peet, Mark Mason and Kelly Stofer joining the group. Thank you to our team of contractors and staff who have worked so diligently to deliver the ParcelMap BC project. While I thank everyone I must single out Brian Greening and Peter Haas. We would not be so close to a complete Provincial parcel fabric without the expertise of both these gentleman. Please take time to visit with Brian and some of his staff at the booth that is set-up – adjacent to the exhibitor's area.

The focus of the LSATF will soon turn to Project ACE as discussed below.

Project ACE (Advanced Customer Enhancements)

Project ACE has three primary objectives:

- replace the ageing Electronic Filing System;
- improve services to stakeholders and customers using modern technology; and
- develop and implement a "people plan" for the future

The basic electronic filing system (EFS) infrastructure is now 15 years old. In terms of technology 15 years makes it brittle and at risk of failure, meaning it is in need of replacement and upgrade.

Additionally, stakeholder feedback has noted that some of the .PDF forms are too technical and contain non-intuitive requirements. Customers have asked for a 'wizard' type of process that guides the applicant step by step, with helpful hints at each stage. Customers have suggested that access to real time guides as to how to complete forms would be helpful.

Project ACE is about making improvements such as these that directly benefit the customer. The changes the LTSA made through our 2009-2012 Business Transformation Initiative focused on internal systems and electronic filing that created many benefits for the LTSA. The main focus of Project ACE is the external customer. I will have much more information for land surveyors as part of the fall travelling Board Trip.

That being said the LTSA recently announced some of the early gains from the project. For example land title documents can now be accessed through Scan of Demand. These features allow you to acquire a copy of a document that only exists in microfilm or hardcopy. Additionally if you are involved in a legal matter you can now acquire a 'certified copy' of a document or a plan electronically.

Miscellaneous myLTSA News

A reminder that the Land Title and Survey Authority of BC (LTSA) regularly communicates system updates and enhancements, along with land title and survey practice or policy updates, through its email newsletters. I strongly encourage land surveyors to ensure they subscribe to receive myLTSA System Update and other LTSA email newsletters through myLTSA.

Elimination of Additional Electronic Filing Exemptions

Effective March 1, 2017 the Director of Land Titles eliminated the electronic filing exemption for a number of application previously requiring preliminary inspection including caveats, certificates of pending litigation, provincial expropriations, injunctions and Securities Act charges. These instruments must now be filed electronically.

In addition all Form C – mortgage release must now be filed electronically. This leaves only a Form C release of claims of builder's liens that can be filed in person or by mail (in paper).

Conclusion

In closing, I note that BC land surveyors continue to be very relevant in the growth and development of British Columbia, providing fundamental support to the economic and social fabric of the province through the diligent preparation of quality surveys. We thank you for commitment to delivering a quality cadastre to the citizens of BC.

I look forward to seeing many of you at the seminar in the Lower Mainland on June 1, 2017.

Thank you ✣

March 16, 2017 – 3:10 pm – ABCLS Annual Meeting Report 2017

Submitted by Robert Allen, BCLS Life Member, CLS Ret'd

CGVD2013 – Provincial Adoption January 2018

Accessing & Deriving CGVD2013 Elevations

GeoBC (Brad Hlasny and Tyson Altenhoff)
Parallel Geo-Services Inc. (Greg Keel)

The second in a series of columns to provide information to the members of the Association of BC Land Surveyors (ABCLS) regarding the Province of British Columbia's plans for adopting CGVD2013 – the new vertical datum for Canada. Technical details are available on the GeoBC website http://geobc.gov.bc.ca/base-mapping/atlas/gsr/vertical_modernization.html

British Columbia is adopting a new vertical datum/ height system on January 1, 2018. The vertical datum (and associated elevations) will now be different and it is critical that this be identified on existing and new business data.

1. Overview

In the last column, we provided an introductory overview of the Canadian Geodetic Vertical Datum of 2013 (CGVD2013) which is realized by a new geoid model (CGG2013). This datum & geoid is very compatible with GNSS positioning techniques and will also provide accurate coverage nationally. CGVD28 will continue to co-exist during an interim transition period where both CGVD28 and CGVD2013 elevations will be available to users through the MASCOT website (much like the transition from NAD27 to NAD83).

In some areas of the province the differences between CGVD28 and CGVD2013 are only a few centimetres however, in other regions, the shifts are 50cm or greater. In all cases it will be important to clearly indicate which datum elevations are being referred to, in order to avoid confusion and to mitigate discrepancies going into the future.

This second article (in a series of columns leading up to provincial adoption) provides a reminder to land surveyors about the upcoming change and focuses on the typical ways that the land surveyor would access the CGVD2013 datum.

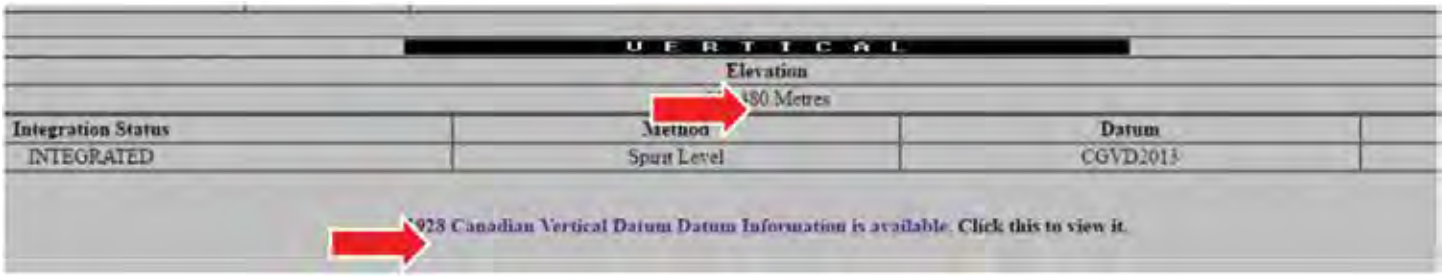
2. Existing Monumentation (MASCOT)

The Province has obtained revised/adjusted CGVD2013 elevations for the first-order federal levelling network of geodetic benchmarks. In regions where provincial data (levelling) has been integrated with the federal benchmarks (BM), GeoBC will make adjustments of those networks and provide CGVD2013 elevations for the secondary vertical control stations. Among these "secondary" vertical control stations are the Integrated Survey Area (ISA) geodetic control monuments.

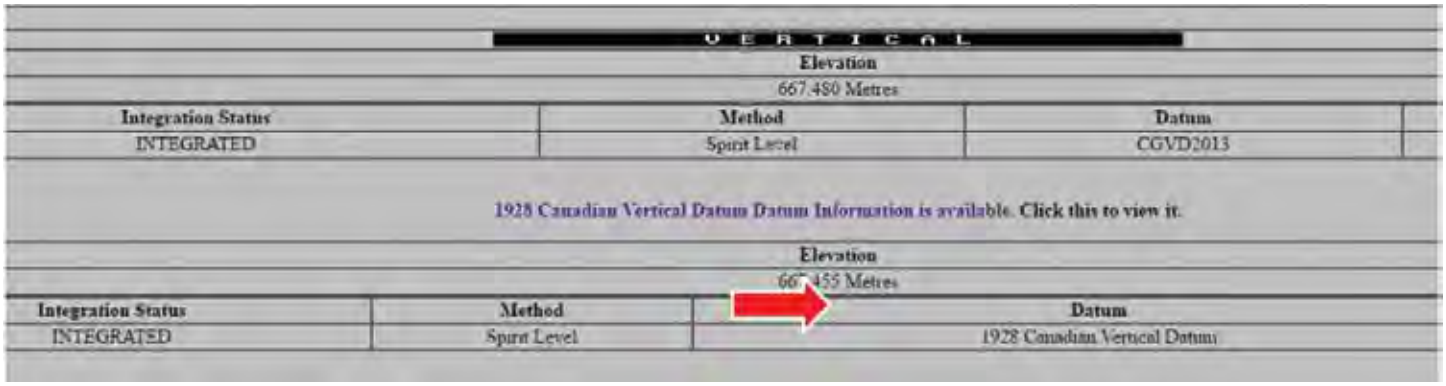
As a result, all ISAs will, as of January 2018, have published CGVD2013 elevations thus providing a simple means of accessing the new vertical datum (CGV2013) as well as the shifts from the old datum (CGVD28). However, in rural areas where monumentation may be sparse, this will not be the most efficient means of accessing the new datum.

GeoBC will provide the revised elevations on the new datum via MASCOT's standard outputs:

Screen Captures from MASCOT Website:



Note the additional link regarding CGVD28 datum. Click on link to get old datum elevation



VERTICAL		
Elevation		
667.480 Metres		
Integration Status	Method	Datum
INTEGRATED	Spirit Level	CGVD2013

1928 Canadian Vertical Datum Datum Information is available. Click this to view it.

Elevation		
667.455 Metres		
Integration Status	Method	Datum
INTEGRATED	Spirit Level	1928 Canadian Vertical Datum

New CGG2013 gravity field information will also be provided. Users will also have the ability to view the older gravity field information.

5. Gravity Field Data

Component (CGG13)	Magnitude	Std. Dev.
Meridian Defl.Xi(+N)	-8.5 s	
Prime Vert Defl.ETA(+E)	-2.3 s	
Geoid-Ell. Separation (Ell. Ht. = Ortho.Elev + Geoid.Ell.Sep)	-19.328 m	0.022 m

As usual, information about the vertical datum shifts will also be provided (this example shows a 0.178m change from CGVD28 to CGVD2013).

10. Current Marker Classification Comment

HORZ	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
VERT	2014-02-25			VALUES VERTICAL DATUM CHANGE TO CGVD2013
	2005-03-25			REFRESH (GREATER VANCOUVER REGIONAL DIST)
	-	-	-	-

```
 59634      4001  E    672584.498 0.9998623 0.9998970    644898      87H2764  TERR   88  2 28     199.406
199.433
                  N   6181120.904                        224113        4016  TERR  177 40 15     812.979
813.092
                  E1       672.892 CGVD2013             505982        4040  TERR  328 45 60     592.807
592.889
                  E1       672.691 CVD28BC              959734        4096  TERR  357 42 35     244.600
244.634
                                                         15206        4056  TERR  357 44 34     459.068
459.131

 45922      4003  E    674210.514 0.9998717 0.9998994    185611        4046  TERR   88 39 14     965.035
965.157
                  N   6181186.533                         26           4089  TERR   90  4 32     413.029
413.082
                  E1       657.530 CGVD2013             651570        4090  TERR  177 41 25     434.856    434.913
                  E1       657.342 CVD28BC              126128        4018  TERR  177 43 17     812.643
812.748
                                                        610048      90H6404  TERR  268 37 38     435.655
435.712
                                                        454322      87H2763  TERR  357 57  7     336.408
336.450
```

ISA Listings

The standard ISA listings found on the LTSA's website provide survey control monument coordinates and elevations. The format of the ISA listings may change slightly in order to provide land surveyors with both the old datum and new datum elevations. Both the new (CGVD2013) and old (CGVD28) elevations have been provided.

3. Deriving Your Own CGVD2013 Elevations and BMs

3.1. Survey Ties to Existing Control – Conventional Levelling

As per the common practice where surveyors establish vertical elevations or BMs for control surveys, conventional levelling (or trigonometric levelling) can be used to extend or densify an existing monumented vertical network. There would be no changes to existing procedures, QC or publication of such elevations.

3.2. Survey Ties to Existing Control Using GNSS

Rather than spirit levelling, CGVD2013 lends itself perfectly to the use of GNSS to establish elevations at unknown points. However, users must ensure that their devices are properly configured with CGG2013 as their selected geoid model. With regards to the ellipsoidal height, (a vital component of the final derived orthometric elevation), users can determine this value with an accuracy of a few centimetres using survey-grade GNSS positioning techniques and equipment: Static GNSS survey and RTK survey (using a personal base station or a service provider network).

An ellipsoidal height is referenced to a mathematical surface thus, typically, no physical meaning. For practical applications GNSS ellipsoidal heights must be converted to orthometric heights by applying values derived from a geoid model which provides the separation between the ellipsoid and geoid (via the geoid undulation or geoid height), as shown in Figure 1 below.

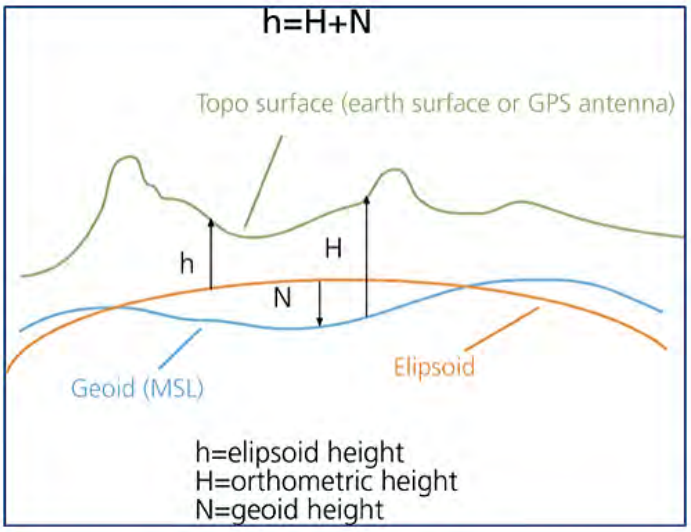


Figure 1: The relationship between ellipsoidal and orthometric heights

The new published geoid model, Canadian Gravimetric Geoid model of 2013 (CGG2013), has an absolute accuracy of approximately 2cm for most regions across the country with the exception of the Western Cordillera, at one sigma (67% confidence). In rough terrain (i.e. in the Rocky Mountains) the absolute accuracy approaches 10cm. However, the relative precision of the geoid model (between two points) is generally 1 to 2cm for baselines as long as 100km, even in the Rocky Mountains. Therefore, the current precision and accuracy of the geoid model can support most regional height referencing requirements.

Rather than spirit levelling, CGVD2013 lends itself perfectly to the use of GNSS to establish elevations at unknown points. However, users must ensure that their devices are properly configured with CGG2013 as their selected geoid model.

When considering using this methodology to derive an orthometric height, one must remember to take into account the accuracy capabilities of the GNSS receiver to be used, the survey methodology as well as the accuracy of the geoid during the design and planning stages. Taking into consideration the error of the two significant components that go into determining a GNSS-derived orthometric elevation (along with other error sources), we can arrive at a general statement to estimate the resulting uncertainty in that elevation by following the concept of the propagation of error as shown in the formula below. The resulting Vertical Error (or accuracy) will be the square root of the "sum of the squares" of your survey accuracy and the geoid accuracy.

A couple of practical examples of using GNSS in recent projects have been provided below to demonstrate some typical vertical accuracies obtainable. As always, results vary based on many factors. For brevity, many details are limited.

Example 1 – District Of North Cowichan/ Duncan Area

Static GPS

- Compared static GPS-derived elevations with elevations from recent high-precision leveling.

Users can submit RINEX observation data from single or dual-frequency GNSS receivers operating in static or kinematic mode, and recover enhanced positioning accuracy referenced to the datum of your choice.

- Long static GPS sessions (>2hrs) during periods with strong vertical geometry (VDOP), and with excellent local tracking conditions (low blockages).
- GPS-derived elevations agreed <1cm for stations 1-4km apart

RTK GNSS

- Comparisons were made with known control stations in the District's ISA network. RTK was used as a coarse check on parts of this vertical network considered to have lower reliability (note that these orthometric elevations used for RTK comparisons cannot be considered errorless).
- RTK was operated in single-base mode with distances of 4.0 - 11.5km using GNSS observations (GPS + GLONASS), during periods with good vertical geometry, and with generally good local tracking conditions.
- Two 60-second averaged RTK sessions were compared in the field (accepted if vertical agreement <1cm). A full "antenna dump" (re-initialization) was done between each session.
- RTK-derived elevations showed agreement generally <2.5cm (worst: 4cm).

Example 2 – Nanaimo Area

Static GPS – Medium/Long Baselines

- Elevation testing at five existing stations with accurate elevations, spanning ~11km across Nanaimo's ISA with comparisons made on orthometric elevations from recent precise leveling connected to Federal BMs.
- Very long static GPS sessions (3-4hrs) during periods with strong vertical geometry, and with excellent local tracking conditions to determine the best achievable GPS vertical results over medium/long distances.
- Adjacent stations showed GPS-derived elevation differences with <1cm agreement, growing to 3cm over the full 11km extent of this test network.

Static GPS – Short Baselines

- Nine comparisons were made over short distances (150-300m) with seven of the comparisons being 3mm or less (meeting 1st or 2nd order leveling specifications). The two worst comparisons were 7mm and 11mm (3rd or 4th order over these short distances).
- Note these comparisons were based on a routine ISA network densification survey done in the past, with the GPS survey designed to achieve optimum horizontal accuracy, not vertical.

3.3 Determination of Elevations Using NRCan's PPP Service

NRCan's CSRS-PPP is an online application for post processing that provides users with higher accuracy positions from their raw GNSS measurement data. CSRS-PPP uses the precise GNSS satellite orbit ephemerides and clock models to compute the user's corrected coordinates and accuracy estimates anywhere on the globe, regardless of proximity to any known base stations.

Users can submit RINEX observation data from single or dual-frequency GNSS receivers operating in static or kinematic mode, and recover enhanced positioning accuracy referenced to the datum of your choice. Horizontal datum options include, amongst other options: NAD83(CSRS)v3-1997 for Vancouver Island, NAD83(CSRS)v4-2002 for the rest of BC. The CSRS-PPP results show computed ellipsoid height and also derived orthometric elevations referenced to either the new CGVD2013 datum, or the old CGVD28 datum (using the HTv2.0 model).

Therefore, a user anywhere in BC can collect raw data with a survey-grade GNSS receiver at a site with reasonable tracking conditions, and then use CSRS-PPP to derive an elevation referenced to the CGVD2013 vertical datum. Essentially establishing one's own bench mark!

Detailed PPP accuracy testing was done at a controlled GNSS validation range in Nanaimo during 2016/2017, as well as at other sites throughout BC. The following is a brief summary of key findings:

Example 3 – Nanaimo Area Using PPP

Note: Testing was done with a single-frequency GPS receivers of two classes (normal and narrow-correlator). PPP vertical accuracies were poor (50-100cm) with an hour of data. It is not recommended to use single-frequency receivers for establishing accurate elevations with PPP. All further testing reported here is from dual-frequency receivers.

- PPP results are computed using the best ephemerides available when the user's data is submitted for processing. Initially the "NRCan hourly" ephemerides are used (latency ~1.5hrs), then these are replaced with the "NRCan Rapid" ephemerides (latency ~18hrs), and finally these are replaced with the "IGS Final" precise ephemerides (latency ~2 weeks). The type of ephemerides used is reported on the bottom of the PPP results listings. In testing done, marginal accuracy improvements were generally seen with later ephemerides. It is suggested that waiting for 18+ hours after data collection before submitting for PPP processing is a good practice so that the "NRCan Rapid" ephemerides will be used.

- PPP provides accuracy estimates for the Latitude, Longitude, and Height coordinate components for each process run (shown in the listings as "Sigmas(95%)"). In this controlled testing, these estimates were found to be reasonable most of the time (actual error < PPP estimated accuracy). However, there were exceptions, including examples when the actual error was more than twice the PPP estimated error. In limited testing, it appeared that adding GLONASS observations made the accuracy estimates less valid. It is suggested that users should treat the PPP accuracy estimates as an indicator, but not as a guarantee of coordinate accuracy.

- PPP accuracies improve with longer datasets. The convergence time depends on the number of satellites and their geometry, and also on other factors including the tracking conditions. To test this convergence, several 4 hour datasets were split into 1 hour blocks and each was separately submitted for PPP processing. The full 4 hour datasets converged to estimated vertical accuracies of 2-3cm. The hourly datasets converged to estimated vertical accuracies in the range of 8-25cm.

- It would be expected that adding GLONASS in addition to GPS would significantly improve the convergence time and accuracy with effectively double the number of observations. However, this was not found during this limited testing. In synchronized side-by-side testing, the PPP estimated accuracies were better (lower) for GPS+GLONASS, but the actual errors seen were similar horizontal, and they were actually worse vertical.

- All GNSS positioning is affected by the local tracking environment, and this includes PPP. The difference in convergence time and accuracies can be substantial. It is recommended users test their own GNSS systems in a perfect tracking environment, and then exactly 1 day later repeat the same test period in a less than perfect tracking environment (i.e. repeated GPS coverage). PPP will show differences in the residual plots (missing sections where there are obstructions and nosier residuals showing multipath), and also in the two summary statistics near the top of the report listing: (Aposteriori Phase Std, and Aposteriori Code Std). These values are compared with the Apriori values (assumed in advance), and users should understand how their specific GNSS system compares to the Apriori values, and pay attention to these summary stats on each PPP listing.

- Finally, as with any survey, surveyors using any survey method should include checks on their work. For example, during PPP testing in late 2016 an error occurred at NRCan affecting the antenna models applied during processing. This error induced ~7cm vertical errors in all results using this specific antenna model. The error was caught because of testing at a station with known accurate elevations, otherwise it may have gone undetected.

4. Summary

Professional land surveyors and engineers will play a substantial role in mitigating errors resulting from the adoption of the new vertical datum by providing appropriate advice and expertise to their clients and stakeholders. When the elevation difference between CGVD28 and CGVD2013 has been accounted for, it is important to identify which datum was used on Air Space plans, wellsite plans, construction and engineering drawings, bylaws and regulations, and other documents that make reference to elevations. The aspect of best practices will be discussed in a future article. ✣

Ootsa Lake Odyssey

by Jay Sherwood

George and Else Seel – A Pioneer Life on the Headwaters of the Nechako Watershed

Book Review by Robert Allen,
BCLS (Life Member) CLS (Retired)

Jay Sherwood has done it again with his latest very interesting book Ootsa Lake Odyssey, subtitled George and Else Seel – A Pioneer Life on the Headwaters of the Nechako Watershed. Some of you may know Rupert Seel, their son, who spent most of his working career with McElhanney Surveys. George left his home country of Germany in about 1910 and made the convoluted trip to Ootsa Lake, arriving in the autumn of 1914 after working his way west on railroad construction. He was trained as a stonemason but to earn a living near his new home, he took up trapping and prospecting and later in life, some farming and ranching.

The Nechako Reservoir and Ootsa Lake are 'out of the way' locations even now and one can only imagine the difficulties getting there in the early part of the 20th century. Nowadays, by floatplane, Ootsa Lake is about 240 kilometres due west of Prince George or one can drive the 200 odd kilometres to Burns Lake and then go 20 kilometres south and across Francois Lake by ferry and go another 40 kilometres south west to Ootsa Lake. Another access is from Houston which is about 75 kilometres west of Burns Lake and then a further drive of another 70 or so kilometres south. It is this latter route that I took to the Nechako Reservoir on a moose hunting trip in 1988 but little did I know then that I was right in the middle of George's old stomping grounds.

In the first part of the 20th century, access to the Ootsa Lake area was via a pack horse trail from Bella Coola and it was this route that Edward Colley, BCLS, used to get to Ootsa and Francois Lakes each summer to survey various properties in the area. A few short years later, once the Grand Trunk Pacific Railroad (now the Canadian National Railroad) was built, access was via Prince Rupert (from the west) and then to Burns Lake and then south to Ootsa. In 1927, Else answered an advertisement in a newspaper in Berlin from a German-Canadian at Ootsa Lake who was looking for a wife and she soon made the trip by ship and train to Vancouver and George met her there and they were married the next day. They then took a ship to Prince Rupert, the train to Burns Lake, and then by car the rest of the way to Wistaria, the location of their new home on Ootsa Lake. That must have been quite a cultural shock for Else.

Jay refers to Else's diary and uses numerous photographs from her collection that are still extant in the University of Victoria Archives. The book goes on to describe the couple's tough life through the 1920s to the early 1950s; George away trapping, hunting or prospecting for many days at a time, little or no household income or food, minimal interaction with the neighbours and complete reliance on others for vehicular assistance. Nonetheless, George and Else persevered and they had two children and provided for them as best as they could. Else was an accomplished

George and Else Seel at their home on Ootsa Lake, Winter 1927-1928.University of Victoria Archives 3-31-5

Rupert, Else, and Gloria Seel at their home on Ootsa Lake.
University of Victoria Archives 3-32-8

writer and wrote numerous poems and short stories which were published, mainly in Germany.

George's passing also signalled the "End of Ootsa" (the title of the last chapter). George who was born in 1888, died at home on April 1, 1950 and work began in earnest on the Alcan Project about the same time by McElhanney Surveys. In June 1950, the Seel's daughter, Gloria, graduated from Burns Lake High School and in the autumn moved to Victoria to attend Normal School and become a teacher. Her mother, Else, went with her. Early in 1951, Else bought a small house in Vancouver and Rupert stayed on at Ootsa Lake for a couple of years. He moved their cabins to some of their higher ground that wasn't going to be flooded and from that home base he worked for McElhanney until the Alcan project was completed at which time he moved to their Vancouver Office where he continued his long and varied career with them. One of the first people Rupert met on the job was Doug Meredith, BCLS #368, and they became life-long friends with Doug being Rupert's best man at his wedding. Seel Lake is named after George Seel and the mineral claims he staked on Swing Peak are still active and are currently owned by his grandson.

Rupert and I have known each other for over 35 years. The following comments were made by Stan Nickel, BCLS, when I told him of Jay's presentation and I couldn't agree more with Stan's words: "It's good to discover some background information about my McElhanny colleague, Rupert Seel. Some of my impressions about Rupert Seel include a gentle and thoughtful demeanor, together with mental toughness, personal dependability and superlative technical skills. I still regret that my BCLS exams conflicted with an invitation from Rupert to accompany him for a project in Alexandria, Egypt - my loss.

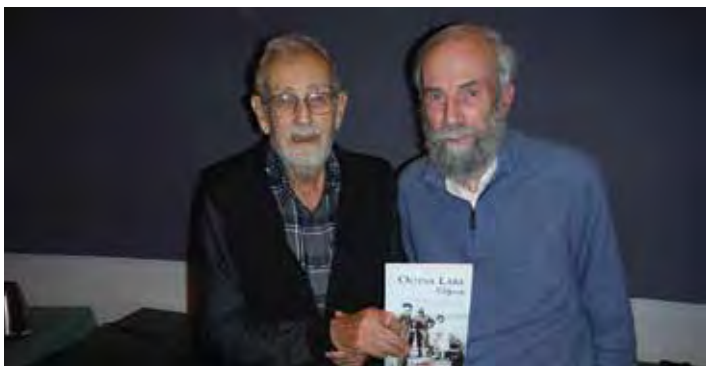
In 1952, construction of the Kenny Dam was completed and the Nechako Reservoir was created to provide water storage for the hydro-electric project to be constructed at Kemano which would ultimately supply power for the aluminum smelter at Kitimat (Alcan project). The new dam cut off all water flow to the Nechako River for four years while the Reservoir filled to capacity and it flooded much of the land the Seels and their neighbours occupied. The Cheslatta indigenous people were also displaced when the area of their villages and homes was required for a spillway in which to release excess water if needed.

The book is about George and Else's pioneer life in a remote area, the good times and the bad times and everything in between. Else spent nearly 25 years at Ootsa Lake and except for a short time during World War Two, while working at the Pinchi Mine, George spent 35 years there. George was buried in the small cemetery at Wistaria. Else was born in Germany 1894 and died in Vancouver in 1974.

A quote from Else's diary describes her feelings and probably those of most other homesteaders of the area. She says: "Oh you sheep, where is the romanticism? There is nothing but wearing old clothes and frayed shoes and a diet of fish and game meat. But it doesn't upset me – I know now the limitation of the world and its pleasures."

Jay finishes the book with the following quote: "The Seel homestead on Ootsa Lake has been submerged under the Nechako Reservoir, but Else's diaries, photographs, and other documents about her and George help recount the story of life among the lakes and mountains on the headwaters of the Nechako during the first half of the twentieth century".

Jay has 'recounted the story' and put it into book form for all of us to read and enjoy. Jay was at the Sechelt Library on January 26th and gave a presentation on the book. Rupert and some of his family were in attendance along with a number of other folks interested in that early lifestyle. Copies of the book can be obtained from Jay through his website: *http://surveyingbc.ca/index.htm* ✣



Rupert Seel, on the left and author, Jay Sherwood.
Robert Allen photo

Doug Roy's Photo Albums

Robert Allen BCLS
(Life Member) CLS (Retired)

Conrad (Con) Duncan and Doug Roy
Naping Fjord, Baffin Island

Doug was BCLS #295 and Life Member #69. He was also DLS #801 and a Life Member P.Eng. Doug was born in November 1921 and passed away in April 2013. Doug's obituary was in the August 2013 edition of The Link.

About eighteen months ago, Doug's son, Peter, dropped off two of Doug's photo albums for me thinking that I would rather have them than he, as they contained a number of surveying pictures. I went through both albums. One had photos from 1943 from northern Quebec and Nunavut and the other had photos from an area west of Prince George. There were 64 photos in the former album and the last photo in it was the only one with any clue as to what it might be and it is shown at the top of the page.

As you will see, it says "Duncan + Roy Aug 25/43 Ottawa Winnipeg". Doug was from Winnipeg, I already knew that, and "Duncan" was from Ottawa. I thought they both must have been working for the federal government that summer. I remembered a 'Con Duncan' coming out to the Nass River, north of Terrace, to visit our survey crew the summer I worked for the Department of Mines and Technical Surveys (now Natural Resources Canada). Apparently his job, as a field inspector, was to visit the various federal government survey crews working in the field each summer. I didn't know if it was the same 'Duncan' or not until I gave the two albums to super-sleuth

Sta. 19 Chapman Bay

Dining Room and Kitchen, Glover Lake
(Doug Roy is on the left)

There isn't a lot of information available online, but there appears to be quite a bit if one can get to the National Archives in Ottawa and look in the appropriate 'box'.

Planting post Ft. McKenzie

Camp at Sta. 30, Viola Bay, Foxe Basin

Dunc McKenzie on traverse

Jay Sherwood to look over. It didn't take Jay too long to find reference to the work the two of them did that summer and it was the same Con Duncan that I had recalled visiting us.

There isn't a lot of information available online, but there appears to be quite a bit if one can get to the National Archives in Ottawa and look in the appropriate 'box'. Under the 'Scope and Content' of one set of records, it says "Records left by C.M. Duncan and his assistant D.J. Roy at Bowman Bay, Foxe Peninsula, Baffin Island. Duncan and Roy, employed by the Dept. of Mines and Resources, were making astrofixes to aid ground control for air mapping when they discovered records left by J.D. Soper." Another 'box' contains more of Duncan's records but access to most of them is "Restricted by law". I'm not sure why that is the case but there must be a good reason.

Most of the photos were lightly glued to the album pages and so I gently lifted them all off the pages and on the back of the photo above was written "Doug Roy, Con Duncan, Naping Fjord – Baffin Island". A couple of other photos in the album also had Naping Fjord written on the back of them but I can't find any reference to a Naping Fjord so it may well have a new name now. Other photos were noted as being in different locations and some had no indication at all where they may have been taken.

A representative sampling of some of the photos follows and the caption for each is what is written on the back of each photo.

My next project is to go through Doug's other album and see what treasures I can find in there. ✣

Nugluk in Pangnirtung Inlet

(No notation but Doug Roy is on the left)

The CIC on Boundary Resolution

Submitted by: *Complaint Inquiry Committee (CIC)*

The CIC recently reviewed a file where a member was retained to repost a large rural lot established in the early 1900's. Land surveyors did work within the large plan area since that time, but all had re-established cadastral boundaries only to the extent needed for their surveys; none had done a comprehensive search for evidence from the original survey. Many subsequent surveys derived their resolutions from these more recent surveys. The member's survey was not close to most of these more recent surveys and it became apparent that there were large discrepancies between the plan dimensions and field measurements.

In the course of performing the survey, the member arrived at different possible boundary solutions based on the evidence found. It was clear that misclosures existed in the original survey, most likely due to the accuracy of surveys at that time, and that some plan dimensions were missing. The member tied in some posts that had been established from original evidence, but these were located away from the lot under survey. In addition, the member found several unregistered posts and tied in fence lines as part of the survey.

The member assessed all this evidence to arrive at their solution, but not without difficulty and concerns from landowners affected by their decision. The CIC wanted to highlight some points for all members to consider when faced with a similar situation.

- The age of the plan from which the title is based on must be considered when re-establishing boundaries within it. When the original plan was prepared, there were very limited survey instructions regarding procedures, accuracies and plan preparation. A plan of this age was probably surveyed using a compass and a Gunther chain. Therefore, do not expect the same level of agreement we get when working from more recent plans. Surveys of this age normally have not set durable long-lasting posts and may not have set many posts at all. Often there are dimensions missing and you must make judgements as to the intent of the original survey. It is these original boundaries that legal title is based on, and it is your responsibility to re-establish these boundaries created by the old plan in their original locations.

- Many surveys prepared in the 1950s and 1960s involved a re-establishment of boundaries shown on inaccurate and incomplete subdivision plans. Many land surveyors showed very limited information on how they had resolved the boundaries. A common understanding during this period was that a surveyor would re-establish and "sort out" the boundaries to the best of their ability and these surveys would not be questioned. Thus, these newer surveys sometimes failed to deal with all the errors in an older plan.

- Unregistered bars, pipes and iron posts must be considered as evidence of property corners, and the courts have typically accepted unregistered monuments as evidence. Prior to the introduction of the Land Title Act in 1977, reposting surveys were not routinely filed in the Land Registry Office. Many surveyors showed additional posting as "scenery" on their subdivision plans as a means of recording some of their reposting surveys; however the majority of reposting surveys were probably never recorded in the Land Registry Office. In some cases, it may not have been a land surveyor who set the unregistered posts. Property owners often placed bars or pipes where they found old wood posts, and these bars or pipes could be the best evidence of where the original wood posts were located.

The onus is on a land surveyor to conclusively show that an old bar, pipe, unregistered iron post or improvement was not on the original boundary. Courts would most likely uphold them unless it can be clearly demonstrated that these unregistered monuments or improvements were in error.

- Fences and other improvements that have been long accepted as representing a boundary, must be given due consideration as evidence. Occupation is a critical component in the hierarchy of evidence and must be considered if it can reasonably be dated back to the original survey. Old fences are often replaced with newer fences; therefore even newer fences cannot be easily dismissed. Other factors that may need to be considered when weighing occupation in your solution are

the location of roadbeds, onsite improvements and local, historical knowledge of owners.

- The hierarchy of evidence and Section 5 of the Land Survey Act are clear that the use of proportioning dimensions is a last resort and only to be used when there is no evidence from which the original corner can be satisfactorily ascertained. Our laws do not support the notion that proportioning is fair and equitable when physical evidence to define property boundaries is available. Proportioning has its place when all evidence of boundaries has been lost, but when used inappropriately, incorrect boundary re-establishment can occur, especially when dealing with very old original surveys. Careful consideration of all evidence including unregistered posts and occupation as well as more recent surveys and how they established the boundaries is critical.

It should be noted that giving the exact widths of roads as detailed in the Land Survey Act Section 5(3) only refers to "township, range or section line". Although giving exact widths to roads is common practice for re-establishments in subdivision plans, it must not override any evidence found in the field that suggests the road was not established at the exact width stated on the plan. The hierarchy of evidence must be respected.

If you will be undertaking a survey of this nature, the CIC encourages you to consider the five points above.

These types of surveys are challenging but are very rewarding when you can say: "I completed all of the necessary research, found all of the existing evidence, considered the evidence in terms of the hierarchy, and produced a legal plan that correctly re-established the boundaries for my client and the other owners in the neighbourhood". You will have established a correct cadastral fabric that your peers and the public can rely on for many years to come. ✣

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Hiking on the Sunshine Coast

Robert Allen BCLS *(Life Member) CLS (Retired)*

January 23, 2017, Wagon Trail
- Photo by Robert Allen

What does one do when retired? For me, there aren't enough hours in the day to do everything I would like to do but one of the things that takes up my Mondays, and often my Wednesdays, is hiking. I belong to the Monday Hiking Group and the Wednesday Hiking Group on the Sunshine Coast and we do different hikes each hiking day on different trails on the Coast. The Wednesday hikes are usually a bit longer and more strenuous than the Monday hikes. Because of the cancer on the bottom of my left foot, I had to take most of the last year and a half off from hiking but the cancer is now gone and my foot has more or less healed, so I started hiking again in earnest at the beginning of January 2017. Most of the trails on the Coast were built by mountain bikers and while most are single track trails, they are easy to walk on but they definitely aren't flat. There is always lots of vertical gain and drop as well. Most follow old long-abandoned logging roads and even railway grades but they are smooth to ride on and therefore easy underfoot while walking as well. There are a few purpose-built hiking trails but they aren't nearly as nice to walk on as a lot of the logs, roots, rocks, and stumps haven't been removed.

We also do some off-Coast hikes. Some of these hikes have been to Mount Seymour and some in the Squamish area. We have walked on the ferry at Langdale and walked off in Horseshoe Bay then hiked up towards Cypress Bowl. Each summer some of us try to get away for a few days and hike the Cathedral Lakes area near Keremeos, the Whistler area, Manning Park, Mount Baker, etc.

All of the trails on the Coast are named, usually by those building them. Some names are Hells Hills, Suncoaster Trail, Cabin Fever, Frogger, Duracell, Ripped Nipple, Twister, Cunning Stunts, Hwy 102, Wicked Ditches, and the list goes on. I have over 400 GPS tracks of the trails we have been on and there are many more I haven't been on. Our hikes often start about 10:00 am and we are usually done by 3:00 pm covering between 10 km to 15 km and up to 500 metres vertical.

On January 23, 2017, we hiked up the Lower Tube Trail and then on to the Upper Tube Trail, Caroline's Connector, Wagon Trail, Kevin's Trail and then back on some roads to our cars. On our hike, one of the trails goes by the old cabin shown on the cover of this issue. As I understand a conscientious objector during World War II lived in it and only 'snuck' out to civilization when he needed some food staples. It is on the lower slopes of Mount Elphinstone in the Roberts Creek area between Sechelt and Gibsons near N 49o 28' / W 123o 39'. Its location has been known for a number of years and fortunately it hasn't suffered from any significant damage other than falling apart from old age. It is made from split red cedar planks and that has helped save it from the elements.

There are a few other cabins scattered around the hills on the Coast but none are in as good shape as this one as the rest of them have started to fall in on themselves.

The 'original' Wagon Trail, shown in the photo above, goes back to the early 1900's when there was a large demand for shingles and shakes. Wagons were used to haul the shingle and shake bolts across the hillside of Mount

Elphinstone to a flume that went down to the ocean near Gibsons. The grade is relatively flat and there are remains of some of the old bridges along the trail.

There were 21 of us on this Monday hike. The weather was good and was a new trail for quite a few of the hikers. Luckily the bridge held everyone.

This trail was built on a logging road that had been put to bed so it had a good hard surface.

Fortunately there are many dedicated trail builders on the Coast who build and maintain these trails. We've done about 300 metres of vertical at this point and another 200 metres of vertical to go to the top. The person second from the right is Bob Sitter and he has climbed with Larry Marshik, BCLS, and Neil Bennett, BCLS. Bob is in the process of writing a book about hiking and climbing experiences and I hope to do a review of the book once it is complete.

More information about trails on the Sunshine Coast can be found at the Sunshine Coast Trails Society website: *http://sctrails.ca/*

Another excellent website for trail information is Sunshine Coast Trails: http://www.sunshine-coast-trails.com/

For anyone wanting to view more of my photos from the hikes I have done, go to: https://sunshinecoasthikingphotos.shutterfly.com/ Once there, click on "pictures" in the Welcome Message and view up to 50 different albums. ✣

August 27, 2014, Single Track Trail in Tetrahedron Provincial Park - *Photo by Robert Allen*

January 30, 2017, Bridge over Wakefield Creek - *Photo by Robert Allen*

August 20, 2014, On the Trail up Mount Elphinstone - *Photo by Robert Allen*

SECTION 59.1 LAND SURVEYORS ACT – WHAT DOES IT MEAN?

An interesting discussion in regards to Section 59.1 of the Land Surveyors Act has emerged in the last three Link issues. To recount;

In the April 2016 issue of The Link, Richard Redfern, BCLS shared his recent experiences in encountering a refusal of access while carrying out a survey, and he also shared his perspectives on some possible limitations of Section 59.1.

In rebuttal, in the August 2016 issue of The Link, John Motherwell, BCLS expressed his opinion that Section 59.1 grants an absolute right of access to the land surveyor when carrying out his or her professional duties.

On a parallel theme, Kelly Stofer, BCLS offered his perspective as ABCLS Secretary of the value of the land surveyor asking for permission prior to entering property, even if not required under the Act, and the appropriate conduct for members to follow. Conducting oneself in a professional manner will enhance the public perception of our profession (see the December 2016 issue of The Link).

These articles have resulted in additional discussion amongst our membership and the following questions have emerged;

- Does Section 59.1 of the Land Surveyors Act apply to so called "non-statutory work"?
- Mr. Motherwell, BCLS asserts the notion that Section 59.1 of The Act grants an absolute right of access to the land surveyor. Is this the case?
- Are there any limitations to the authority that Section 59.1 gives to land surveyors, as suggested by Richard Redfern, BCLS in the April 2016 edition of The Link?
- If a land surveyor is refused access to a property, and the decision is made to seek access pursuant to S. 59.1 of the Land Surveyors Act, what is the appropriate process to be followed?

The following perspectives on these questions are offered by the Practice Advisory Department and Ray Gandhi, legal council for the ABCLS.

1. Does Section 59.1 of the Land Surveyors Act apply to so called "non-statutory work" where the survey is for a purpose other than a plan prepared pursuant to a provincial statute for filing in the Land Title Office or Crown Land Registry?

Section 59.1 applies to the "practice of land surveying", which is defined in the Act, and is copied below;

"practice of land surveying" means:

(a) the measurement of land or airspace to

(i) determine, locate, define, describe, establish or re-establish boundaries, or

(ii) determine the location of any natural or artificial feature on land or in airspace relative to a boundary for the purpose of certifying in writing the location of the natural or artificial feature,

and without limiting subparagraphs (i) and (ii), may include:

(iii) integrating any monument that defines a boundary, either directly or indirectly, with a network of geodetic points of any order of precision and determining coordinate values for the monument when those values are used in the development or maintenance of a geographic information system that will be used in whole or in part for determining or establishing boundaries,

(iv) establishing control points for the purpose of carrying out the activities in subparagraphs (i) to (iii),

(v) preparing maps, plans and documents in any format with respect to determining or establishing boundaries, and

(vi) giving advice with respect to land surveying, determining and establishing boundaries and spatial relationships and the rules and regulations pertaining to land surveying, and

(b) advising on, reporting on or supervising any of the activities listed in paragraph (a).

"To force entry, a BCLS would need to make application to the Court for an order directing entry after having notified the owner of both 59.1 and 59.2. That is a cost that, I presume, would be passed to the client. It would be prudent for the BCLS – after concluding that entry is necessary - to have the client seek legal advice and to have client's lawyer bring the application to court."

So, if the work you are doing falls under the above definition, then Section 59.1 applies. For example, Section 59.1 should apply to field work in support of the typical BCLS Building Location Certificate or topographic survey where it is necessary to determine boundaries or certify the location of features with respect to boundaries. It should also apply to a building layout where it is necessary to set the building in relation to the parcel boundaries.

If a land surveyor is uncertain whether Section 59.1 applies to his or her situation, then the member should obtain legal advice. For example, consider the following;

- The case where a land surveyor wants to enter a property to scout out or stake a potential pipeline/ powerline route,
- The instance where a land surveyor wants to enter an adjacent property to collect topographical information of relevance to his or her client's property (i.e., determine the location of structures on the adjacent parcel, or collect shots on the adjacent parcel to determine drainage patterns, etc.),
- The instance where a land surveyor wants to enter a property to tie photo-identifiable points or set photo targets for photogrammetric purposes,
- The situation where a land surveyor wants to enter adjacent properties to tie houses on the block, to determine the correct height to layout his or her client's house (i.e., to ensure that the right "height esthetic" is maintained).

In complex instances such as these, land surveyors should obtain legal advice prior to seeking access by Section 59.1 of the Land Surveyors Act.

1. In the August, 2016 issue of The Link, Mr. Motherwell, BCLS asserts the notion that Section 59.1 of the Act grants an absolute right of access to the land surveyor. Is this the case? Are there limitations to the rights conferred to the land surveyor by this section?

(Ray Gandhi); " I agree with the opinion of Mr. Motherwell, but would add the following comments:

To take the benefit of Section 59.1, a BCLS must be engaged in the "practice of land surveying" as that phrase is defined in Section 1. I suspect that the Court would imply a term that the access required be reasonable in the circumstances (you might not be able to walk through someone's house, at midnight)."

2. Are there other limitations to the authority that S 59.1 gives to land surveyors? What of the following passage (submitted by Rich Redfern, BCLS in the April 2016 edition of the Link)?

(Rich Redfern, BCLS); "I am of the opinion that the authority given

The land surveyor should only seek access pursuant to Section 59.1 following a conversation with the client, and it may be preferable that the client (or the client's lawyer) be charged with the process of obtaining access (rather than the land surveyor).

to land surveyors under Section 59.1 of the Act does not extend to circumstances where one party in a dispute is under the belief that survey work carried out on their property and against their will may have an adverse effect on their rights."

(Ray Gandhi, in response to question number 3); "To the extent that entry is denied, it would be the choice of the BCLS to attempt to force entry, or not. Mr. Redfern quite properly took a principled stand to say that he would not enter a property without consent (and in this case perhaps did not need to do so). While the Act might have authorized Mr. Redfern to take a different approach, requiring consent is what I would consider to be the civilized approach in the face of a law that gives every BCLS a somewhat extraordinary power. I would go so far as to suggest that a BCLS should not put herself or himself in the position of "triggering" a confrontation with a third party. That isn't so much legal advice, but common sense – when exercising authority under Section 59.1, the BCLS should remember that, in the heat of the moment, paper (in this case the carefully worded statute) does NOT beat rock (which is what might be thrown if you enter a property without consent.)"

3. If a land surveyor is refused access to a property, and the decision is made to seek access pursuant to Section 59.1 of the Land Surveyors Act, what is the appropriate process to be followed?

(Ray Gandhi); "To force entry, a BCLS would need to make application to the Court for an order directing entry after having notified the owner of both 59.1 and 59.2. That is a cost that, I presume, would be passed to the client. It would be prudent for the BCLS – after concluding that entry is necessary - to have the client seek legal advice and to have the client's lawyer bring the application to court."

Conclusion

The Practice Advisory Department emphasizes the following points:

- It is best practice for a land surveyor to ask for permission to enter a property prior to entry- this may take the form of the field crew leaving a calling card if visiting a property when no one is home.
- Surveyors need to be aware of their responsibilities which relate to The Land Surveyors Act.
- Section 59.1(2) of The Act requires that the land surveyor or field staff show identification if so asked by a land owner.
- Land surveyors and field staff must show respect for property (e.g. fill in holes, leave gates as they were found, tie back vegetation, etc.), and Section 59.3 of The Act provides for the compensation of an owner by a land surveyor in the event of property damage during a survey, if so direct by the Courts.
- The situation may arise where the land surveyor is denied access, but chooses not to seek access pursuant to Section 59.1 of the Land Surveyors Act (as in the situation described by Richard Redfern in question number 3).
- The land surveyor should only seek access pursuant to Section 59.1 following a conversation with the client, and it may be preferable that the client (or the client's lawyer) be charged with the process of obtaining access (rather than the land surveyor).
- It may be that other (more practical) solutions are available, and Section 59.1 should only be used as a last resort.
- Finally, land surveyors and their field staff should always remember that some complex sites (e.g. railways, industrial sites) will have specific safety protocols which must always be observed, regardless of the method in which the site is accessed. ✣

Submitted by Robert Allen, BCLS Life Member, CLS Ret'd

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New Commissions

Jason Whale, Albert Koehler, Darren Kent

Albert Koehler, BCLS #974

Albert was born in Aachen Germany and grew up in Prince George. He chose to become a land surveyor because he enjoys problem solving, being outside, working with computers and the variety of the work — land surveying offers all of these and more. Albert would like to thank his wife and family, Darren Kent, Tyler Mikkelson, Richard Redfern, Bronwyn Denton, Tracey Peet, Mitch Laseur and all the other land surveyors who helped him along the way. When Albert is not land surveying he enjoys quad biking, snowmobiling, camping, hunting, fishing and spending time with his wife and two boys.

Andrew Pearce & Ron Johns

Andrew Pearce catching "the big one"!

Andrew Pearce, BCLS #969

Andrew Pearce was commissioned on December 7, 2016 in Sidney by Ron Johns. He was born and grew up in Smithers. Andrew chose to become a land surveyor because he wanted to live in a small town and needed a trade in which he could work at while maintaining a small town lifestyle. A family friend of his was the local land surveyor in Smithers and encouraged him to pursue land surveying as a career. He was enrolled in an engineering program at the time but thought it would be a good fit to apply for the Geomatics Engineering degree program. Andrew liked the mix of office and field work the career promised as well as the variety of physical work and mathematical calculation.

Andrew would like to thank his wife Sue Pearce, and the BCLS's of HBH Land Surveying: Rebecca Broten, Gina Hidber, Mark Rossman and Steve Howard for helping him along the way. When Andrew is not land surveying he enjoys fishing, watching and playing hockey and spending time with his family.

Mike Thomson, Brian Ngan, Brian Brown

Brian Ngan, BCLS #977

Brian was born in Hong Kong, but has been in Vancouver since he was 2 years old. He chose to become a land surveyor to follow in his father's footsteps. Brian would like to that the Association and all the other BCLS's that assisted him along the way.

When he is not land surveying Brian enjoys motorcycling with no destination in mind. Recently he became a father—2017 is indeed a happy one!

New Commissions

Brian Brown and James Bruce

James Bruce and his little guy George hiking above Cameron Lake on Vancouver Island

James Bruce, BCLS #976

James Bruce was commissioned on December 27, 2016 by Brian Brown in Whistler. He was born in Vancouver and grew up in North Vancouver. James chose land surveying as he has always had a keen interest in the outdoors, exploring and finding interesting old things. As it turns out, surveying incorporates all those characteristics with a bit of math thrown in. He would like to thank his wife Tracy for enduring all the lost weekends to studying and projects; his dad for introducing him to the profession and his mom for pushing him along. He would also like to thank Mike and Helen Sims for their support and guidance, along with his friends, family and coworkers for encouraging him through the process. When James is not surveying he enjoys mountain biking, skiing, hiking, bike touring and chasing his ten month old son around. He is also slowly working on a small hobby farm with the initial crop being hops for his home brewing.

John Haggerty and Kelly Stofer

John Haggerty with his family Elke, Emma, Gordon, Alexander & Julianna

John Haggerty, BCLS #968

John Haggerty was commissioned on December 6, 2016 by Kelly Stofer in Sidney at the ABCLS office. He was born in Winnipeg and grew up in Edmonton. Since his father was a land surveyor, John was proud to follow in his footsteps as a professional. John would like to thank his father Gordon Haggerty, Keith McNaughton, John Wallace, Roger Ross, Wade Pennell, Bryan Bates and many more for helping him along the way. He moved to the Peace Country with his family 13 years ago where he loves the lifestyle of the area.

When John is not land surveying he enjoys raising his 4 children, gardening, and wood working. John has also played the bagpipes for 25 years, and is currently the Pipe Major for the Fort St. John Rotary Pipe Band.

New Commissions

Chris Cryderman, Kyle Phillips, Bob Flynn

Kyle Phillips, BCLS #973

Kyle was born in Surrey and grew up in Nanaimo. He chose the land surveying profession because he enjoys the variety, complexity and importance of the work a land surveyor does. Kyle would like to thank his family, Bob Flynn, David Lyon and Brian Collins for helping him get where he is today. You can find Kyle playing soccer when he is not land surveying.

Bronwyn Denton, Michael Rogers, Kelly Stofer

Michael Rogers and his companion Nanuk

Michael Rogers, BCLS #970

Michael was commissioned on December 10th, 2016 by Bronwyn Denton and Kelly Stofer at the Association office in Sidney. He chose to become a land surveyor as he was attracted to the history behind the profession. The work itself is mentally challenging, and at times physically challenging, which he finds to be a great balance. Legal surveys involve many different aspects or tasks; it is this variety that he finds appealing.

There are quite a few people Michael would like to thank! Gord Gamble for hiring him way back in the day, and involving him in decisions regarding projects, survey issues or challenges. Bronwyn Denton who always encouraged him to continue with his studies and progression to his commission. Richard Redfern, his master, to whom he will always be indebted. Other land surveyors who were always willing to answer a question or discuss a topic were Bert Hol, Mark Cahill, Rob MacDonald and Rory O'Connell. Dave Hall, a previous co-worker and survey technologist, who's love of the "survey" as well as his enthusiasm for old retracement surveys and locating that difficult piece of survey evidence were truly contagious. The staff from his local office. His father, who provided Michael with a great example of what it means to be a true professional. Last of all, but most importantly, his lovely wife Denise. For the sacrifices she has made and the patience she has shown for his progress he is forever indebted to her.

"Any day on two wheels is a great day" someone once told Michael, and he whole heartedly agrees. When he is not land surveying, any type of cycling/biking (pedal or motorized) is of interest to him. His love of skiing, camping and snowshoeing has led him back to and keeps him in the Kootenays.

New Commissions

Chris Cryderman, Mike Rinsma, Shannon Aldridge

Mike Rinsma, BCLS #975

Mike Rinsma was commissioned on December 23, 2016 by Chris Cryderman in Coquitlam. He was born in Calgary and grew up in Vancouver. Mike chose to become a land surveyor in order to work outdoors, to work with high tech equipment, and to constantly be faced with new challenges and problems.

He would like to thank Shannon Aldridge, Craig Nakamura and everyone at Target Land Surveying as well as his most amazing, beautiful and wonderful partner Elizabeth Hand. When Mike is not surveying he enjoys biking, sailing, reading, playing guitar, music and running.

Jason Whale, Patrick Randall, Greg Calvert

Patrick Randall, BCLS #971

Patrick Randall was commissioned on December 9, 2016 in Fort St. John by Jason Whale. He was born in Nampa, Idaho and grew up in Fort St. John. After working at Vector for a few years he realized he loved the challenges, the people, the diversity of work, and the amazing locations and decided to become a land surveyor. Pat would like to thank Kerrimyeah and his kids along with Jason, Greg, Peter and anyone else who has helped him get where he is today. When he is not working, Pat enjoys football, blacksmithing, camping and quad biking.

Mike Shaw, Rob Adriaensen, Mike Thomson

Rob Adriaensen Spey fishing with his catch of the day!

Rob Adriaensen, BCLS #972

Rob Adriaensen was commissioned on December 12, 2016 by Mike Thomson in Port Coquitlam. He got into surveying by chance as he wanted to learn how to use celestial bodies for navigation and saw that in surveying you learned (at that time) how to determine azimuths using star and sun observations. So he signed up! Rob would like to thank Neil Bennett, Pat Korabek and Mike Shaw for the support and encouragement. He would also like to thank Walter Frith and Vern Goudal for giving him a start in land surveying, and his parents, who were always there for him in tough times. Rob enjoys fly fishing (in particular Spey fishing for steelhead), hunting, camping, dirt bike riding, skiing and spending time at his cabin on Pitt Lake, BC.

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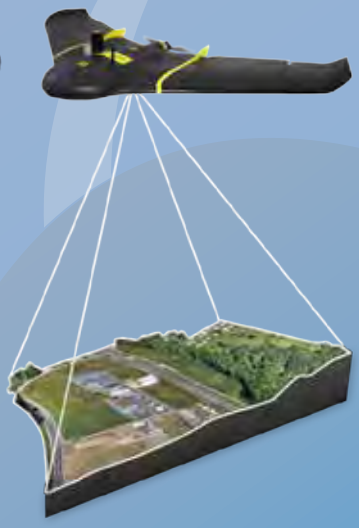

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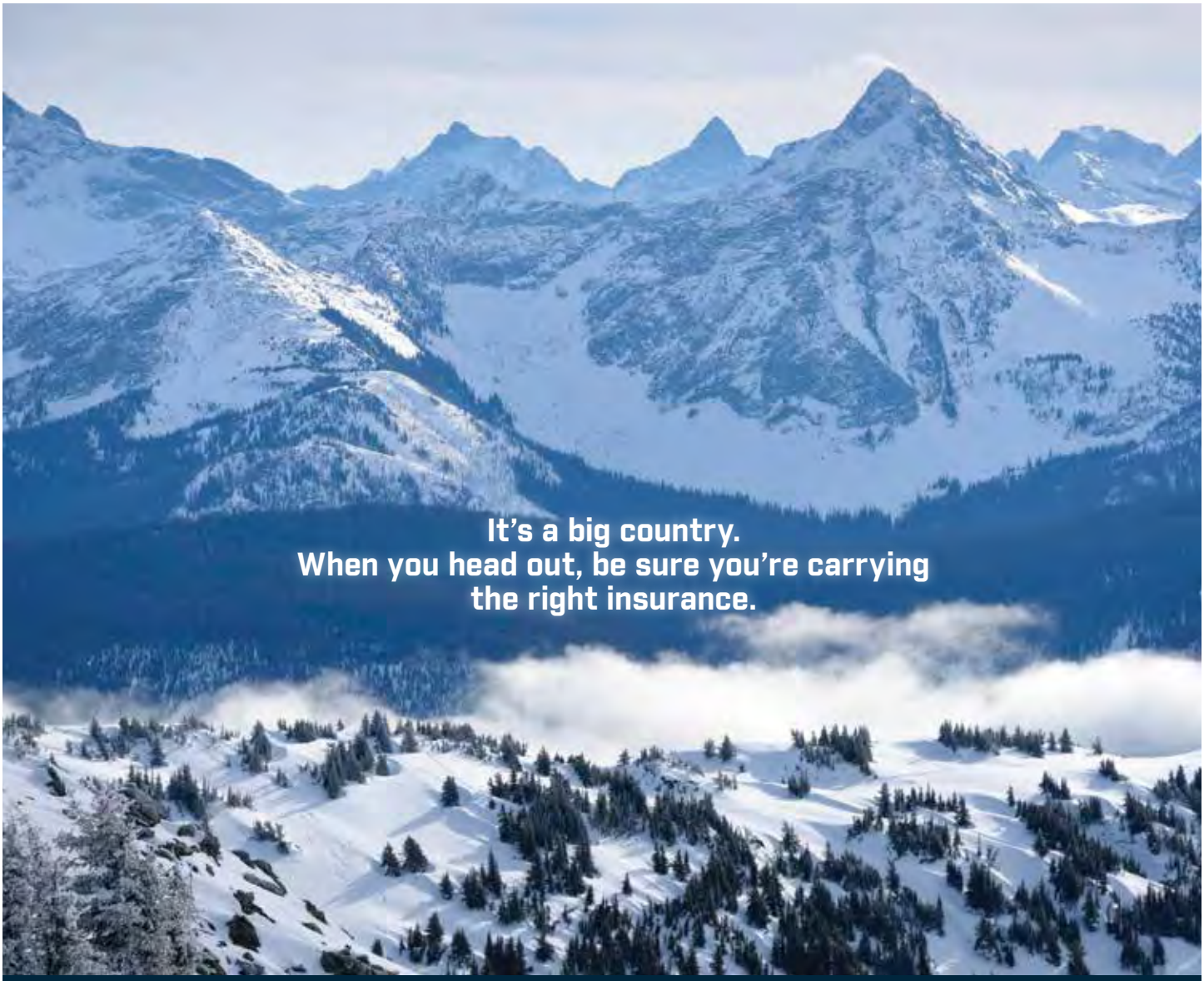

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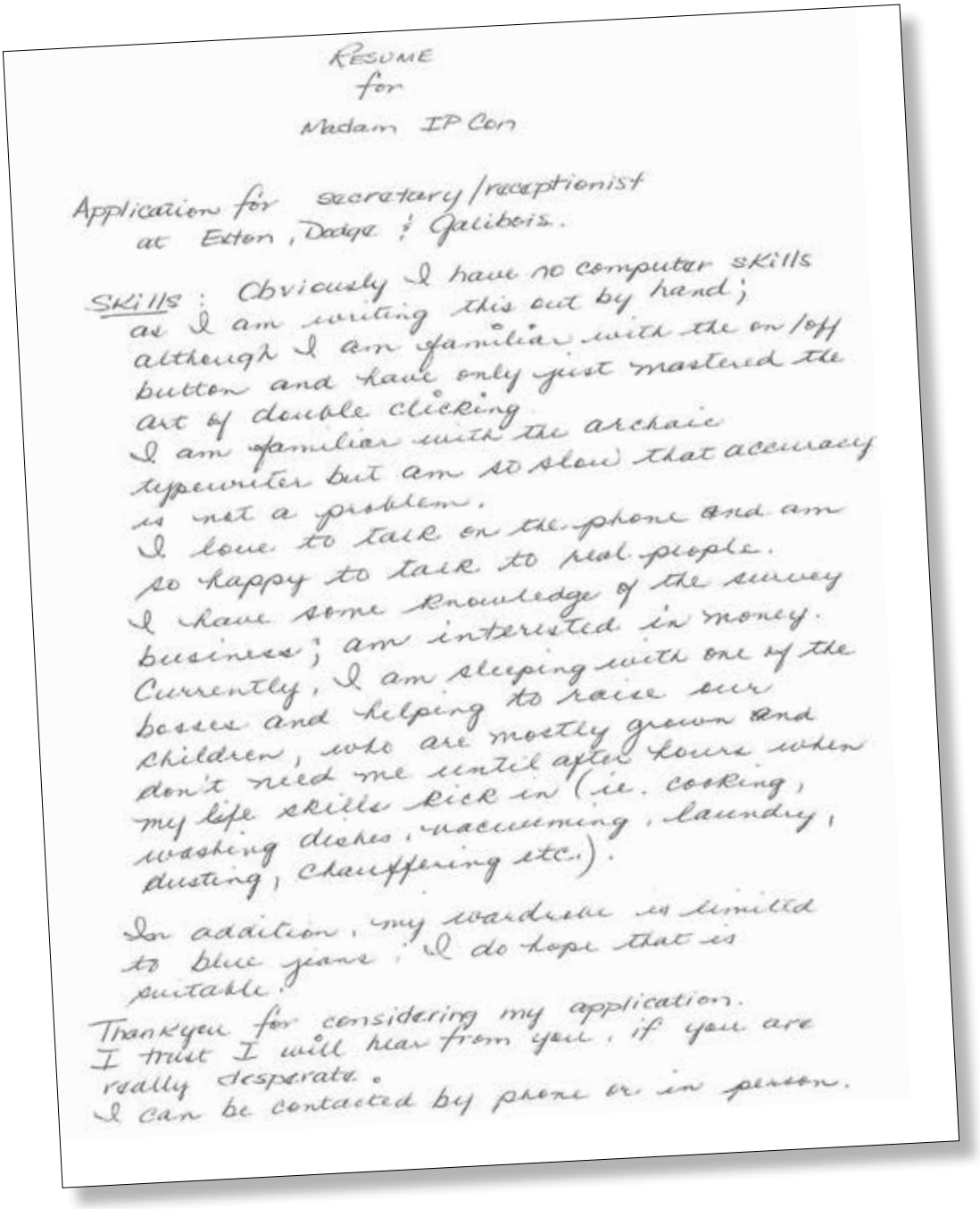
RESUME FOR MADAM IP CON

Submitted by: Doug Dodge, BCLS, CLS

In 1999 our company (Exton, Dodge and Galibois) was looking for a new secretary/receptionist. My wife submitted the attached which is worth a chuckle.



RESUME
for
Madam IP Con

Application for secretary/receptionist
at Exton, Dodge & Galibois.

SKILLS: Obviously I have no computer skills as I am writing this out by hand; although I am familiar with the on/off button and have only just mastered the art of double clicking.
I am familiar with the archaic typewriter but am so slow that accuracy is not a problem.
I love to talk on the phone and am so happy to talk to real people.
I have some knowledge of the survey business; am interested in money.
Currently, I am sleeping with one of the bosses and helping to raise our children, who are mostly grown and don't need me until after hours when my life skills kick in (ie. cooking, washing dishes, vacuuming, laundry, dusting, chauffering etc.).

In addition, my wardrobe is limited to blue jeans. I do hope that is suitable.

Thankyou for considering my application.
I trust I will hear from you, if you are really desperate.
I can be contacted by phone or in person.

Application for secretary/receptionist at Exton, Dodge & Galibois

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Thank you for considering my application. I trust I will hear from you if you are really desperate. I can be contacted by phone or in person.

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Canadian Generally Accepted Land Surveying Principles

Part 1

Principles to guide the development of Land Surveying governance models and legal boundary frameworks in Canada

1 The Canadian social and economic landscape is underpinned by effective Land Surveying governance models and legal boundary frameworks.

Source: http://www.nrcan.gc.ca

Rationale: Integrated land management is fundamental to peace, order and good governance. A reliable parcel and boundary fabric based on the legal principles established by Canadian society is the foundation that supports community and natural resource development and administration, public registration of rights and peaceful occupation of land. All contribute to the value of land and underpin Canada's economy by providing the certainty necessary to support investment and leverage property to obtain capital.

2 Land Surveying governance models in Canada support the constitutional authority and legal system of the Government of Canada, Indigenous Peoples and the Governments of each Province and Territory.

Source: quo-fairo-ui.com

Rationale: With the exception of Canada Lands, property rights fall under provincial and territorial jurisdiction within the Canadian Constitution. Land Survey principles ensure a consistent approach to boundary establishment and also ensure a robust model of boundary definition. Although there are differences between the Civil Code and Common Law, the land surveying community in Canada strives to provide common levels of professionalism in providing services to the citizens of Canada.

3 Land Surveying principles in Canada are based on the physical demarcation of boundaries representing the extent of rights and restrictions applied to the landscape such as traditional boundaries representing indigenous rights, markers or monuments placed by land surveyors, evidence of occupation or natural features.

source: http://www.landsurveyinghistory.ab.ca

Rationale: Activity happens on the landscape therefore boundaries must be clearly identifiable on the ground. Land surveyors provide the physical link to the land from the paper documentation of rights and restrictions affecting the land such as Aboriginal treaties, international or inter-provincial/territorial legislation, private property titles, leases and easements and rights on Crown land. All activity on the land from the construction of a house to the development of a mine must be related to well-defined boundaries. Boundaries defined by theoretical measurements such as geographic coordinates are an expression of intent and in most cases require subsequent action by a land surveyor such as the placement of, or reference to a monument or connection to a physical feature. This action is also required to apply legal authority to a boundary in Canada's common law provinces.

4 Canadians have access to reliable parcel descriptions for the definition of property; modern online registries and technology allow for efficient and effective access.

Source: NRCAN

Rationale: Open access to land survey records ensures that land surveyors can provide the most efficient and effective service to the public. Canada's land title, cadastre and survey records are generally stored, maintained and indexed in centralized, official registries established by statute and are available for viewing by both the public and professionals. Many jurisdictions have undertaken, or are undertaking work to digitize their collections of survey records and build searchable electronic registers and indexes. This allows for remote digital search and retrieval of relevant boundary information, while reducing the handling and deterioration of delicate and valuable original documents. Many jurisdictions have also developed online Geographic Information System (GIS)-based cadastral mapping utilities that the public and professionals can use to view parcel information, and in some cases directly obtain survey records, using an intuitive, graphical representation of the cadastral fabric. GIS based mapping provides a useful virtual representation, however does not replace field surveys that accurately represent the situation on the ground.

5 Marine survey systems in Canada apply specialized processes to describe and define legal boundaries in Canada's Ocean Space and Inland Waters; however the principles guiding system development, management of boundaries and the delivery of professional services are the same as those applied to the land and are therefore captured by these principles.

Rationale: The marine environment is different than land. Marine boundaries are normally defined by geographic values, based on well-defined spatial reference systems often connected to physical features on Canada's coast or underwater topography/bathymetry. Survey practice requires specialized knowledge of techniques for measuring on and under the surface of Canadian waters, however the principles of professionalism and boundary determination apply in the same way as they do on land.


Source: http://www.hibernia.ca

Part 2

Principles for providing Canadians access to qualified Land Surveying professionals

1 Canadians have access to land surveyors who are highly qualified professionals with consistent standards for licensing or certification across the country.

Source: BCLTA

Rationale: The Canadian public has entrusted the profession of land surveying with the responsibility to protect their interests in land and contribute to a governance model that underpins all activity on land. Canadians must have confidence in a land surveyor's work. Further, all Canadians should expect the same quality of professional service, regardless of where a project is situated in Canada. This qualification standard includes a consistent level of technical qualification, practical training and a strong understanding of the land administration regimes in a land surveyor's jurisdiction of practice.

Land surveyors in Canada have equivalent knowledge that allows them to use the same technologies and reference systems across the country. They are self-governed through associations as defined by legislation. Land Survey Associations (provincial and federal) issue licenses governing practice, including professional ethics and rules that members must respect or be subject to discipline.

To improve access to land surveyors, the Agreement on Internal Trade (AIT), and mutual recognition agreements require professional associations to streamline licensing requirements such that land surveyors can work across provincial and territorial boundaries with a minimum of re-certification. Associations now provide examinations dealing with the laws and application of legal boundary principles in each jurisdiction. Thus supporting an ethics driven approach to land surveying in Canada while ensuring the protection of the public's interests in property.

2 Land surveyors maintain technical relevance and make the best use of available technology in providing services to the public.

Rationale: Land surveyors as measurement scientists and land information professionals maintain technical relevance through continuing professional development. Land surveyors apply advanced technology such as electronic theodolites (total stations), precise Global Navigation Satellite System positioning techniques and Geographic Information Systems to provide the most effective solutions for clients. In addition, land surveyors maintain a current knowledge of changes to land related legislation and the evolving body of jurisprudence impacting boundary determination.

Source: NRCAN

Part 3

Principles that guide the role of the Land Surveyor in Canada

1 **Land surveyors describe and represent boundaries in plans and documents, using narratives that include references to monuments, instruments such as deeds or titles, physical features, coordinates, survey plans and the cadastre in Quebec. Land surveyors may propose but do not make boundaries; boundaries are made by those who have an interest in the land (people, communities, organizations, the Crown) and by the courts.**

Source: Canada Land Survey Records

Rationale: Only the owners of land and the owners of a potential legal interest in land, as guided and allowed by law, can actually create a legal interest in land and make boundaries between those legal interests. It is the role of land surveyors to mark boundaries on the ground or create written descriptions of boundaries to illustrate or describe the limits of rights and restrictions to activity on the land.

2 **Land Surveyor's boundary locations, while often expressed as true and unalterable in jurisdictional legislation, are not guaranteed by government (with a few tribunal-centric exceptions). The extent of a surveyed parcel can be variable; meaning that the character and physical location of some boundaries, such as water boundaries, can change over time.**

Rationale: Modern land surveys are supported by very precise measurements providing increasingly reliable results. As a result, the stated dimensions and area of a parcel shown on a modern plan of survey will normally be very accurate. The dimensions and area of a parcel surveyed over a hundred years ago however will only be as accurate as the instrumentation and survey methodologies available and used during that period. The shape and size of any parcel is therefore defined by the location of monuments as they exist in their original locations on the ground. Boundaries defined by natural features such as a river or lake may migrate over time but can be physically located based on well-defined common law and civil code principles. The accuracy of measurements and areas can be influenced by the period of survey, blunders and the migration of natural features; thus are normally qualified and stated by land surveyors as being "more or less" in legal land descriptions.

Source: NRCAN

3 A land surveyor's establishment of a new boundary, as represented by fieldwork, legal survey plans, research and analysis is not conclusive until the landowner (and, in some cases, the neighbour) consents to the survey and regulatory authorities sanction the survey.

Source: Canada Land Survey Records

Rationale: Although land surveyors physically define new boundaries on the ground, the land surveyor's work does not in itself define a legal boundary. In the case of a subdivision of land, for example, a potential boundary may be marked on the ground (using survey posts), but it is not until that boundary has been approved by the appropriate approving authorities, accepted by those that have a legal interest in the land and recorded in the appropriate registry, that the boundary is actually established and the survey posts become monuments of that boundary. This ensures that the land use planning, land registration and land survey components of Canada's governance frameworks are fully integrated in support of robust and sustainable community and resource development.

4 A land surveyor's opinion in re-establishing an existing boundary must withstand the scrutiny of fellow land surveyors, boundary tribunals and the courts.

Rationale: The land surveyor's work in re-establishing an existing boundary does not follow a fixed set of hard and fast rules. A thorough evaluation of each case and professional judgment are applied to all aspects of the task. Legislation, jurisprudence, civil codes, common law, policies, best practices and measurement tolerances guide the land surveyor's analysis of the available evidence. A land surveyor performing a boundary re-establishment is responsible for acquiring and analyzing all available survey evidence, occupation and title information which often includes verification of the original demarcation and subsequent re-establishments.


Source: NRCAN

A review of documents, monuments, measurements, plans, imagery and other available evidence will sometimes provide conflicting results. A land surveyor uses professional judgment and expertise when applying legal principles and rendering an opinion to those with an interest in land regarding the re-established location of boundaries.

While jurisdictions may offer varying degrees of survey plan examination services prior to approving a plan for filing, it is the land surveyor who is ultimately responsible for the boundary opinion represented by their plan and survey. In undertaking boundary re-establishment, land surveyors have a responsibility to inform their clients and the public regarding the role of the profession, and what can and cannot be determined by a plan of survey. To provide the certainty essential to support secure land tenure, a land surveyor as the professional on the ground must apply legal principles and produce work to a standard of quality that can withstand the scrutiny of the courts.

5 Land surveyors use the best available evidence to re-establish a boundary. The hierarchy of evidence doctrine, which gives most weight to "those things about which people are least likely to be mistaken", is used to resolve ambiguity (for example, between a measurement and a monument)[1].

Source: NRCAN

Rationale: As there are often differences or ambiguities in a parcel description, numerous judicial decisions have handed down the following order of importance of evidence to resolve the ambiguity: first, evidence of natural boundaries; second, evidence of original monuments; third, evidence of occupation (possession) that can reasonably be related back to the time of the original survey; finally, measurements shown on the original plan, field notes or other document.

The hierarchy dates back to the 1800's when surveys were less accurate, so evidence of boundaries found on the ground was - and still is "things which people are least likely to mistake". However, the hierarchy is evolving due to more accurate survey techniques; measurements and coordinates, particularly those that have been repeatedly validated will warrant a higher position in the hierarchy. A land surveyor has the responsibility to ensure that the best available evidence is applied to each boundary re-establishment. Weight is assigned based on all technical information available, new and old, along with a thorough analysis of each piece of evidence giving consideration to vintage and origin and what may have changed since the original survey. A land surveyor considers the human activity that has taken place on the land over time and the dynamic nature of natural boundaries and inaccuracies in their original documented positions.

6 Land surveyors are cautious in upsetting settled possession.

Rationale: Land surveyors are cautious not to disturb settled possession if there is a discrepancy between her/his opinion and the physical occupation on the ground.

In such cases, land surveyors will expand analysis and seek corroborating evidence such as knowledge from adjacent land owners and supporting documentation.

If a boundary was marked by occupation, such as fences, hedges, walls and buildings, when the location of the original monuments was known, then if the original monuments were lost, the location of the boundary might best be represented by the evidence of that occupation. A land surveyor will determine, through analysis of all available evidence, that a structure was actually erected on a boundary. Caution is necessary as fences may merely be constructed for convenience, to retain animals or to discourage trespassers. Of course, there might well be evidence of occupation across an accepted boundary, in which case it is rejected as evidence of the boundary, but assessed for other purposes (for example, adverse possession, prescriptive rights and statutory remedies).

If a boundary was not monumented when it was first established, a land surveyor will turn to the intent of the land owner at the time when the line was created. The intent may have been to follow an existing fence or to set a specific dimension. In absence of evidence of intent, long standing acceptance or acquiescence by owners of features marking a line may represent evidence of the line by agreement or convention. Surveyors will acquire convincing corroborating evidence before upsetting settled boundaries.

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[1] *Greenleaf on the Law of Evidence – Reference to be added*

7 Land surveyors manage precision and accuracy and carefully analyze errors of varying magnitude in conducting work that often involves assessing measurements made over a hundred years ago; Land surveyors do not perfect existing surveys or render adverse opinions, simply because they have conducted the new survey with more precise methods.

Source: NRCAN

Rationale: Surveying equipment and technologies have advanced over time and surveys are now conducted to a very high degree of precision. Land surveyors are well versed in the measurement methodologies used throughout the history of Canada. In the process of re-constructing a boundary a retracement survey is not intended to be more precise; the intent is to follow in the footsteps of a previous land surveyor. Many descriptions are written with dimensions and directions that are approximate and often refer to delimiters that actually control the location of boundaries; (for example, extending 400 feet more or less to a brook). It is very possible that the distance to the brook may in fact be quite different than the dimension quoted in the deed; however the brook is in fact the boundary.

Depending on when a survey was conducted and the physical nature of the terrain, corner monuments established may appear to be displaced with current technology, but often are very representative of the best expected results that could be obtained given the survey methods of the day. It is not the role of a land surveyor to establish boundaries where they should have been had they been surveyed using modern measurement technology, but to use sound judgment and survey practices to place the boundaries where they were originally established by competent authority.

8 Land surveyors as public officers, play a quasi-judicial role and are therefore impartial. They provide assistance independent of and uninfluenced by the interests of a client; avoid and reject the role of advocate; are unbiased; and abide by precepts of procedural fairness.

Rationale: Land surveys have a multi-generational impact. Surveys for one client have the potential to impact adjacent land owners and multiple land owners over time as subsequent transactions take place. All surveys are therefore prepared independently of the expectations or betterment of a client. Further, a land surveyor's work is based on the principles of an impartial evaluation of the best available evidence related to each case. Boundaries are re-established in their true, original and unalterable positions. In this way, the land surveyor, the profession and most importantly the survey itself are seen as truly objective and consequently are of the most value to the client, the public and future generations.

Source: dwellinatlanta.com

9 Land surveyors contribute data and play a leadership role in the development and maintenance of Canadian (federal, provincial, Aboriginal, territorial, municipal) Parcel Mapping data.

Source: NRCAN

Rationale: Surveyors make the measurements that establish, update and maintain the property boundary framework draped over the Canadian landscape. Land surveyors provide the "eyes on the ground" to ensure that digital parcel data represents the actual occupation and activity on the landscape. The land surveyor is the professional that is closest to the source and best qualified to build an accurate virtual representation of the property fabric in Canada. Applying the land surveyor's expertise and professional approach continually improves the quality of parcel mapping data. The land surveyor also applies extensive geographic data integration expertise to support a large number of Geographic Information System applications from land use planning to natural resource management.

Post Renewal Forms Filed with the Surveyor General

Prepared by:

Jeff Beddoes, Senior Deputy Surveyor General, Dave Swaile, Deputy Surveyor General and Calvin Woelke, Team Lead, Records Distribution Services, all of the Surveyor General Division.

It is quite possible that some land surveyors who work in urban environments have never seen a Post Renewal Form.

For about seventy years, land surveyors have been submitting Post Renewal Forms to the Surveyor General as a record of new evidence placed at the corners of primary parcels, such as district lots, sections and blocks originally surveyed under the provincial Land Act or as part of a Dominion survey. The form was developed by the Surveyor General in the mid 1940s, and blank copies of the form were made available to any land surveyor who requested them.

Land surveyors often need to locate primary parcel corners as part of their project and might find a corner marked with an old, rotting wood post and deteriorating ancillary evidence. The land surveyor will normally upgrade the corner by placing a capped post, possibly rebuilding a stone mound and opening up old bearing trees or carving new ones. If the survey results in the preparation and filing of a statutory plan, this information will be shown on the plan. However, if no plan is prepared (for example, if no measurements were taken between posts), the land surveyor completes a Post Renewal Form for each restored corner and submits it to the Surveyor General.

The Post Renewal Form will generally show what corner was replaced, the original evidence found, a cap diagram for the new post, and a record of any new ancillary evidence made; it will be signed and dated by the land surveyor performing the restoration.

The Surveyor General Division has many boxes of Post Renewal Forms dating back to the 1940s; they are sorted by land district, and numerically by primary parcel designation. Because these forms provide such important information about what a land surveyor can expect to find at a particular parcel corner, Records Distribution Services staff will generally provide any related Post Renewal Forms whenever a field book is requested from us; however Post Renewal Forms can also be requested separately.

RENEWAL OF SURVEY MONUMENT

By Permanent Monument according to Regulations under Section 7 of the "Land Act," as enacted by Chapter 49, Statutes of 1947.

P.H. 8 L.I.

Department No. 115/31 Pages 48

Lot or Section No. 1050

District

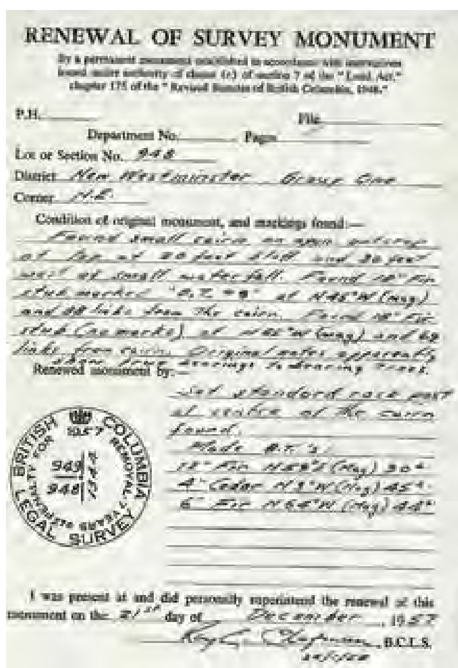
Corner

Condition of original monument when found :—

Renewed monument by :—

I was present at and did personally superintend the renewal of this monument on the 1st day of May, 1949

B.C.L.S.



RENEWAL OF SURVEY MONUMENT

P.H. File

Department No. Pages

Lot or Section No. 948

District New Westminster Group One

Corner N.E.

Condition of original monument, and markings found:—

Renewed monument by:—

I was present at and did personally superintend the renewal of this monument on the 21st day of December, 1957

B.C.L.S.

Examples of typical post renewal forms

The former practice of Surveyor General staff was to stamp the words "Post Renewed" next to the applicable corner in the parcel's field book whenever a Post Renewal Form was received, as an indication that the corner had been upgraded. However, this practice was not consistently carried out over the years; therefore a Post Renewal Form may well exist, even if no "Post Renewed" stamp is shown in the field book. We have recently completed an indexing project that allows us to more efficiently locate any post renewals associated with a particular parcel, and we are in the process of scanning our entire inventory of Post Renewal Forms.

Example of Field Book Page Showing "Post Renewed" Stamp

POST RENEWAL FORM
SUBMISSION TO SURVEYOR GENERAL
LAND TITLE AND SURVEY AUTHORITY

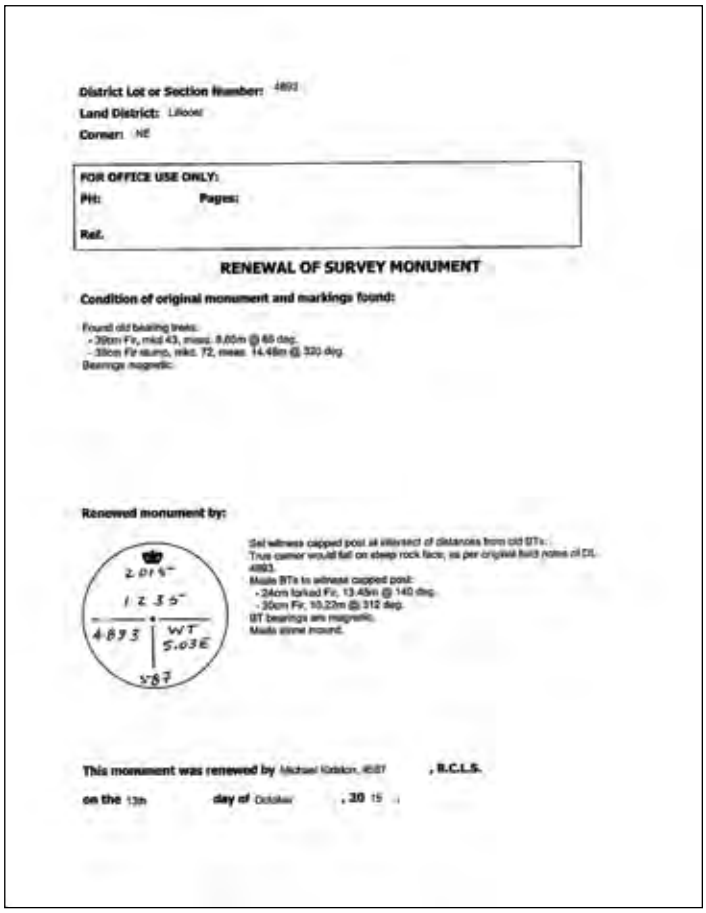
Michael Kidston
JNQ5WS

1. BC LAND SURVEYOR IDENTIFICATION: (Name, address, phone number)
Michael Kidston
Box 970,
250-395-6025
100 Mile House, BC V0K2E0

2. LEGAL DESCRIPTION OF PARCEL(S)
District Lot 4893, Lillooet District

3. CERTIFICATION
I am a British Columbia Land Surveyor and certify that I was present at and personally supervised the renewal of this monument on 2015 October 13 (YYYY Month DD)

4. EXPLANATORY NOTES
Monument renewal card attached



District Lot or Section Number: 4893
Land District: Lillooet
Corner: NE

FOR OFFICE USE ONLY:
Plt: **Pages:**
Ref.

RENEWAL OF SURVEY MONUMENT

Condition of original monument and markings found:

Found old bearing trees:
- 39cm Fir, mkd 43, meas. 8.60m @ 65 deg.
- 38cm Fir stump, mkd. 72, meas. 14.48m @ 320 deg.
Bearings magnetic.

Renewed monument by:

Set witness capped post at intersect of distances from old BTs:
True corner would fall on steep rock face, as per original field notes of DL 4893.
Made BTs to witness capped post:
- 24cm forked Fir, 13.45m @ 140 deg.
- 30cm Fir, 10.22m @ 312 deg.
BT bearings are magnetic.
Made stone mound.

This monument was renewed by Michael Kidston, 4687 **, B.C.L.S.**
on the 13th **day of** October **, 20** 15

Example of New Electronic Post Renewal Form

It is still possible to submit a new Post Renewal Form to the Surveyor General, for those circumstances where a primary parcel corner is upgraded but no statutory plan is prepared. In fact, the renewal form became electronic in 2012.

The modern electronic process for completing and submitting a Post Renewal Form is as follows:

- 1. Download and complete the Electronic Renewal Card (text entry on the card can be completed either electronically within the PDF or filled out by hand on a printed version – either method is entirely acceptable to us);
- 2. Print the renewal card and complete any remaining fields, including the cap diagram, by hand;
- 3. Scan the card and append it to the Post Renewal (SGPR) form;
- 4. Complete the SGPR form and digitally sign it with your Juricert signature;
- 5. Submit the form as a Package to the Surveyor General through myLTSA.

Apart from the $1.50 myLTSA Enterprise service charge, there is no fee for filing a post renewal.

The submission process for post renewals is also described in the Direction to Land Surveyors – Electronic Submission of Statutory Applications to the Surveyor General found on the LTSA website. Surveyor General staff are always happy to answer questions relating to Post Renewal Forms. ✣

5th Annual BCLS Boating Rendezvous – July 22/23, 2017.

New venue for 2017 - "Surveyors On BoatS" will gather at Silva Bay Marine Resort on Gabriola Island for a weekend social. For registration or more information contact Ron Johns, BCLS: ron@rljsurveys.com

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