Transcript of Dr Sarah Beaulieu's Public Presentation and Her Answers to Journalists' Questions 15 July 2021

Transcript of Dr Sarah Beaulieu's Public Presentation

I was honoured to be invited by the Tk'emlups te Secwepemc based on my experience to conduct the survey of ground penetrating radar, also known as GPR.

I'm closing in on a decade of work using GPR within a burial context. My experience with GPR has been used in both Indigenous cemeteries as well as city cemeteries. I have also been called upon by the Canadian First World War Internment Recognition Fund to locate unmarked prisoner of war burials as part of Canada's first national internment operations. In fact the GPR that was used for the survey was provided by the Canadian First World War Internment Recognition Fund to help complete important work such as this.

I've been asked to present the findings of this preliminary investigation. In order to do so, I will first discuss the cultural protocols pertinent to this investigation. I will then provide you with the information pertaining to the specific survey locations. Next I will discuss the use of GPR within a burial context and present some of the common burial features that are used to make these determinations. I will also provide you with the technical slides that will present the data from the site, and take you through the analysis of how these subsurface anomalies became targets of interest. And finally I will present my findings, analysis, and discuss a path forward.

From the outset of this preliminary survey it was important to include community members in the design, the process, interpretation and review of this investigation. This meant that incorporating Indigenous values, ceremonies and methods was an essential part of this process. Cultural protocols took place prior to, during, and after the survey was completed, while oral histories from Knowledge Keepers and Cultural Monitors guided the specific survey locations.

I would like to pay my respects to the Cultural Monitors and the Knowledge Keepers who were present to monitor, provide oral histories, as well as the requisite ceremonies. Cultural protocols are as equally important as the science behind GPR, and given the nature and sensitivity of this work one cannot be done without the other.

It is important to note that remote sensing such as GPR is not necessary to know that children went missing in the Indian residential school context. This fact has been recognized by Indigenous communities for generations. Evidence has existed in government and church archives for more than a century. Canada's Truth and Reconciliation Commission's Final Report identified between four and six thousand missing children, but anticipated that these actual numbers would be much greater. All residential school landscapes are likely to contain burials of missing

children. Remote sensing such as GPR merely provides some spatial specificity to this truth.

Between May 21st and 24th, 7000 square metres of land, just under 2 acres, was covered in the location of the apple orchard at the te Secwepemc Museum and Heritage Park. This area of interest was chosen for the survey based on a number of factors.

First, the Knowledge Keepers' oral histories that recall children as young as six years old being woken in the night to dig holes for burials in the apple orchard.

Second, a juvenile rib bone that surfaced in the same area.

Third, a juvenile tooth that was excavated from a shovel test pit during an impact assessment conducted by Simon Fraser University's Archaeology Department. A juvenile tooth is not an indicator of loss of life, but given both discoveries the possibility should not be discounted.

As a preliminary assessment, this project sought to first ascertain the likelihood of human burials within the study area. Second, begin a preliminary assessment of the possible locations of specific burials, and finally, develop steps to further this work in order to confirm the number and location of possible burials.

In GPR terminology a sub-surface anomaly refers to any irregularity noted below the surface, while a target of interest suggests that the anomaly has an increased index of suspicion for being the object of the search.

As a preliminary assessment, the GPR was conducted in prospection mode. This means ranging across the study zone, following the guidance of the community members, capturing anomalies as screenshots in the digital video logger, and flagging anomaly locations on the ground for further investigation. In addition, grid surveys were conducted for in-depth study as a trial for recommended next steps.

When surveying specifically for burials there are a number of factors that we must take into account during the analysis of GPR data for sub-surface anomalies.

The type of burial, whether it be casket, a vault, or natural will result in notable differences in the reflection signatures, while a casket can be further differentiated based on the material that's used, typically wood or metal.

The date of the burial will also affect whether the casket is intact or has deteriorated or collapsed. Further, when surveying for natural burials with no casket, one must pay attention to the very subtle soil disturbances reflected in the data.

While the depth of the burials can change based on age at time of death and the season in which the burials were dug, typically shallower graves for smaller burials such as juveniles and frozen ground prior to mechanical excavation would also affect the burial depths. Thus, when a grave was dug in winter prior to the use of machinery, the depth of the grave is limited by the challenge in penetrating frozen ground.

The common features of a formal burial in a cemetery setting typically include a convex reflective pattern at the upper surface of the grave shaft, vertical refractive patterns at the sides of the grave shaft, a horizontal reflective pattern at the base of the grave, and also a range of possible reflective patterns for the contents of the grave. These features are not exclusive to burials. However in areas where burials are expected they can act as preliminary confirmation of the likelihood that burials exist and of their specific locations.

This slide provides you with a visual of GPR data acquired within a typical Canadian cemetery context with formal burials. This is not data from the Kamloops Indian Residential site.

The grey screen on the right with the two red lines running through it is known as a radargram. This is what we see on our GPR screens while we are in the field. On this screen we can see the signature hyperbolic response of an adult burial 1.8 metres below the surface. This hyperbolic response correlates with the adult burial in the blue screen on the left. The blue screen on the left is recorded in slice view and exemplifies a grid system conducted in 25 centimetre transects. This provides a bird's-eye view moving incrementally below the surface where one can view the entire gridded section at once, in this case an adult burial on the right and a child's burial on the left. It should be noted that the colours on the screen are arbitrary. Typically, dark blue represents the areas with no soil disturbance while red represents areas with the deepest level of soil disturbance.

The total number of burials and missing children at the Kamloops Indian Residential School landscape is currently unknown as this was a preliminary investigation. My report identifies some of these probable locations. There remain over a hundred and sixty acres that still require surveying before these numbers can be finalized. From my preliminary findings in May to today's results, reports providing additional information related to disturbances from archaeological impact assessments as well as construction in parts of this area were subsequently provided to me. These reports were reviewed in order to determine which of these locations overlapped with the GPR survey areas. After this review it was determined that there remain 200 targets of interest in these preliminary results. Again, here, I must indicate that this is the first part of an investigation with a 'knowing' and oral histories that tells us that there remain [sic] much more work to be done.

The following four slides present examples of some of the data images from this investigation. I will use them to help illustrate the process of data and responses. I will also provide some illustrative highlights on these graphics that indicate some of the signature responses used in determining why these sub-surface anomalies are targets of interest. In the following slides I will call the targets of interest 'probable burials' as they demonstrate multiple GPR characteristics of burials, but only forensic investigation with excavation will be able to conclusively determine this.

In the following screen captures, the X axis indicates the length scanned on the surface while the Y axis indicates the depth of anomalies below the surface. In each of the following screen captures you will also notice a faint grey dot marked under

each of these probable burials. This was a mark that I had placed on my GPR screen in the field in order to make note of these particular anomalies for further analysis.

On this slide the probable burial is located to the right of your screen. The probable burial contains multiple GPR characteristics of a burial. First, the orange semi-circle indicates the convex reflective pattern of the upper surface of the grave shaft that lies approximately .7 metres below the surface. The red arrows indicate the vertical refractive patterns of the sides of the grave shaft. Above this, a surface depression can also be seen above the potential grave shaft. Surface depressions are common at known cemetery sites. Depressions occur over time when the loose soil used to fill a burial shaft compacts, or when a coffin eventually collapses.

Now let me take you to the middle part of the screen capture where we see tree roots that are located just past the 5 metre mark. [Just the previous screen.] These roots have a lower amplitude signal as well as a smaller hyperbolic response which begin right at the surface and not too far below it.

On the second screenshot, it contains several different anomalies that can be contrasted with the probable burial. Here the probable burial is noted on the right of the screen as well, just past the 15 metre mark. It has a notable soil disturbance above the hyperbolic response in addition to reflections from the edge of the vertical grave shaft. The reverse polarity of the waves seen here as black white black indicates a void space below this hyperbolic response.

Now immediately prior to the 15 metre mark we can see the low amplitude signals from the tree root system. And at the 7 metre mark we can also see what we call ring down signatures which is indicative of a metal object below the surface. Both the tree roots as well as the metal object are much smaller hyperbolic responses and are located near the surface, unlike the probable burial that remains .8 metres below the surface.

In this third screen capture the probable burial is observed with a larger, more rounded hyperbolic response just past the 20 metre mark. It also lies approximately .7 metres below the surface. There is a distinct soil disturbance above the area where the probable burial is located, and there's also a clay layer that abruptly terminates where the probable burial is located and continues again after it. This probable burial can be contrasted with the much smaller stone located to the left of the screen just prior to the 15 metre mark which demonstrates a smaller, much sharper hyperbolic response.

The purpose of these slides is to demonstrate that there are many different anomalies that can be seen beneath the surface, and each of these present with a different set of signatures that require a specialized skill set to analyze and interpret. This would be no different than the skill sets required by a physician in order to read and interpret an X-ray.

In this final screen capture it represents one of the areas that we gridded on the site. The blue grid on the left is recorded in slice field and the data on the right represents a single line of the same grid indicating a target of interest that correlates with the area in the left screen capture. [Next slide.]

In addition to the GPR characteristics of burials noted in the survey area and presented in the previous screen captures, I will reiterate that there was additional supporting evidence. The depressions in the orchard that correlate with the sub-surface anomalies observed in the GPR data. There was an east-west configuration of the sub-surface anomalies in the orchard that support typical Christian burial traditions. The juvenile rib bone and tooth discovered in the same survey location. And finally, but most importantly, the ceremonial Knowledge Keepers' oral histories that recall burials in this location.

A preliminary investigation such as this is not intended to provide exact numbers or final results, but rather to confirm the existence of burials. These results are as conclusive as GPR allows, but only forensic investigation with excavation will provide definitive results.

In my experience, though, approaching a decade of work using GPR within a burial context, there are very likely to be many human burials in the study area. Further remote sensing such as GPR should be conducted to locate all possible burials. After all, this investigation has barely scratched the surface, covering just under 2 acres of the total 160 acre residential school site.

In concluding this presentation I would like to circle back to a statement that I made at the beginning. Remote sensing such as GPR is not necessary to know that children went missing in the Indian residential school context. This fact, this 'knowing', has been recognized by Indigenous communities for generations. All residential school landscapes are likely to contain burials of missing children, and remote sensing such as GPR merely provides some spatial specificity to this truth.

Transcript of Sarah Beaulieu's Answers to Journalists' Questions

Neetu Garcha: Hi there, my name is Neetu Garcha. I'm a journalist with Global News. First of all, my heart and my thoughts are with you, Chief Casimir, and the entire Tk'emlups te Secwepemc uh First Nation. My condolences to all of you. Um, it was mentioned, and perhaps, Sarah, you're the best person to answer this question, that part of the reason these 2 acres out of 160 were selected for this GPR survey was because a juvenile rib bone and a tooth were discovered. Do you have any details on when those were discovered, and by whom? Um, and if I can ask a follow-up after I would appreciate . . . . No? OK, that's OK.

Racelle Kooy: I'm very strict on this one. You get one question. Make it good. Thank you.

NG: Thank you.

RK: So we're going to Sarah Beaulieu right to my, first question to my right, please.

Sarah Beaulieu: Um, the juvenile tooth was excavated I think in the late 90s or early 2000s uh in a shovel test pit during uh an archaeological excavation by Simon Fraser

University. The juvenile rib uh surfaced uh in the same area in the early 2000s and was brought in to the museum by a tourist. And it was identified. Yes. Identified as a juvenile rib bone and then documented subsequently from there.

RK: Thank you so much. We're going to go over now to Lindsay Shepherd online. Nora, can you confirm am I just asking the question from the chat, or is she addressing? So from the chat this is uh Lindsay Shepherd is from what media outlet please? Identify yourself in the chat, Lindsay Shepherd, of what media outlet you're from. We'll go to the next question on the floor, thank you so much. True North? So, Lindsay Shepherd from True North. The question is for Sarah. Excavation plans to gain forensic evidence.

SB: Sorry, one more time?

RK: Excavation plans to gain forensic evidence.

SB: I think with regards to forensics and anything else, social justice issues, uh it needs to be community led. Um it wouldn't really be a question for myself to answer, but Chief Kukpi.

[ ]

RK: Thank you so much. We're going to go to the floor.

Jill Macyshon: Uh, my name's Jill Macyshon. I'm with CTV National News. And this is a question for you Dr, is it Sarah Beaulieu? Um, we had initially in the beginning phases heard of 215 potential unmarked graves. We just want clarification. Uh, 200 anomalies now. Is it more of a, are we understanding now more of the actual grave site as opposed to what we first saw in uh late May?

SB: No, nothing's changed. With ground penetrating radar we can never say definitively that they are human remains until you excavate, which is why we need to pull back a little bit and say that they are probable burials, they are targets of interest for sure. They, they have signatures, multiple signatures that present like burials, um but because of that we do need to say that they are probable until one excavates.

[ ]

RK: Thank you. I have a question from Alex McQueen from the Toronto Star. He is directing it to Kukpi, but given what is being asked I'm going to redirect it to our ground penetrating radar specialist because it's about what are the factors to determine numbers of graves and ages of children. So Alex McQueen, we are redirecting your question to our technical expert, Sarah Beaulieu.

SB: With regards to determining number of graves, uh as I went through on the slides it was ruling out different anomalies um such as root systems, stones, rocks, anything else under the surface that didn't present as a potential burial. With the notion of the targets of interest being children, the majority of the anomalies were between .7 and .8 metres below the surface, which is fairly shallow. It fits with the Knowledge Keepers' descriptions of children having to dig graves for one. Um, it also fits with,

when you have a juvenile burial, uh because they are smaller in length they typically are not dug as deeply. Um, so the length would have been taken into account in addition to the depth with the burial as well um to determine um if the targets of interest were potentially children.

[ ]

RK: Thank you. We'll take one more question from the floor and we're wrapping up with that. Oh, I see another person actually, so we'll take, we'll go here, and then there, and then we're wrapping, wrapping up. Thank you so much. Go ahead.

Hi, sorry, Sydney Chisholm, Castanet, Kamloops.

RK: I'm sorry. Uh, you've got your mask on, and that's great, but it's a little muffled.

Sorry, Sydney Chisholm, Castanet, Kamloops. Uh sorry. I was just hoping to clarify, has any site been excavated yet, and is the 215 number still accurate?

RK: Sarah Beaulieu.

SB: As far as excavation for these burials, nothing has been excavated yet. The number is 200. So once the survey was completed um I received, subsequent to the, the survey, uh archaeological reports that um discussed impact assessments and excavation that had been done in the, in the same area, and so had to rule out where those excavations had taken place in the early, late 90s, early 2000s, and see if they um you know impacted where I had done my survey, which is why um I concluded with 200.

RK: Thank you very much. We'll take a final question here.

Kim Mackrael: Thank you so much. Kim Mackrael from the Wall Street Journal. This question is for Dr Beaulieu. Uh, and I'm sorry if I'm not pronouncing that correctly. I'm just wondering if you could walk through a little bit about how you became involved in the first place. Um, did the community ask you to come in, and what , what were the steps you took that led to uh the actual finding?

SB: With this particular site, um, when I, I worked closely with Dr Eldon Yellowhorn at Simon Fraser University, he's a professor in the Indigenous Department there, um, who has a relationship with Tk'emlups te Secwepemc here, um, and because of the work I've done and his knowledge of, um, what I do with GPR, uh, it was a recommendation through there where I was invited to survey for Tk'emlups te Secwepemc.

Dr Sarah Beaulieu's 15 July 2021 public presentation and answers to journalists' questions can be found online at:

https://www.youtube.com/watch?v=unQBkNgQc4M

See also: https://globalnews.ca/video/8030659/more-investigations-need-to-be-done-at-site-of-former-kamloops-b-c-residential-school-site

See also: https://www.cpac.ca/episode?id=cc4fc929-1875-47ee-ac05-257305c08830