



March 5, 2014

**VIA EMAIL**

**(mwallace@elliottlakeinquiry.ca)**

Mark Wallace  
The Elliot Lake Commission  
Inquiry  
2380, boul. St-Laurent  
Ottawa, ON K1G 6C4

Dear Sir:

**Re: Elliot Lake Commission of Inquiry (the “Elliot Lake Inquiry”)**

As you are aware, we act as counsel to Geophysical Survey Systems Inc. (“GSSI”) in respect of the above matter.

We acknowledge receipt of correspondence dated October 4, 2013 from Commission Counsel confirming that the last available date on which our client could give evidence at the Elliot Lake Inquiry was Tuesday, October 8, 2013. As you are aware, our client declined the invitation to give evidence.

As you are also aware, our client was not compellable to attend at the Elliot Lake Inquiry. Notwithstanding, our client cooperated with Commission Counsel and provided information as to the use and functionality of the ground penetrating radar LifeLocator III+ device (the “LifeLocator”) used in Elliot Lake following the tragedy at the Algo Centre Mall. Beyond providing technical details and data analysis, our client was, as you can appreciate, reluctant to get involved in an extra-jurisdictional legal proceeding. Despite the provisions of the *Public Inquiries Act, 2009*, our client could not be guaranteed the same protections afforded to individuals within our jurisdiction. Accordingly, our client’s concerns, while perhaps hypothetical, were legitimate for a party in a foreign jurisdiction.

Be that as it may, we have been requested by our client to assist in clarifying a few outstanding issues and provide brief submissions relating to its interests in this proceeding.

There are two issues which are troubling to our client. There has been some suggestion by Commission Counsel, which arose only after our client confirmed that it was not prepared to attend at the Inquiry, that the LifeLocator device may have malfunctioned or was somehow “unreliable”. Second, there has been a suggestion that perhaps the operator of the LifeLocator device, Constable Hulsman, was not properly trained in its use.

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## **Proper Functioning**

It is of course absolutely clear from the evidence on record at the Inquiry at page 23054 and elsewhere, that Constable Hulsman knew from his training and instruction that he was not operating the LifeLocator in the manner which is directed by GSSI. Specifically, Constable Hulsman was aware that the search area was to be cleared, with neither individuals nor search animals within fifteen (15) metres of the LifeLocator device. The record clearly establishes that there were individuals well within that range during the deployment.

As a premise to any discussion about the use and reliability of our client's equipment, it must, respectfully, be noted that there can be no adverse finding regarding the reliability of the LifeLocator when it is admitted that the device was not deployed properly pursuant to the manufacturer's directions. That is, there can be no finding that the equipment did not work properly when it is admitted that the equipment was not used properly.

There is also a suggestion in the questioning of Constable Hulsman that the LifeLocator could not have been functioning properly if Constable Hulsman detected a "red circle" in the LifeLocator's "run mode" which indicated breathing within 10 metres of the device but did not see a "black square" confirming movement, if the signals were coming from the people actually moving around the search zone proximate to the LifeLocator device. The assumption being that logically, if there were people and movement above the ground that were triggering a "red circle" confirming breathing, then the device should also have triggered a "black square" confirming the actual movement of those people. According to Constable Hulsman, that was not the case and he detected only a "red circle".

Consequently, Constable Hulsman was lead to the conclusion that the "red circle" inferring breathing was not from the people proximate to the LifeLocator because he did not at the same time detect a "black square" confirming movement by those same people. Hence, Constable Hulsman believed that the LifeLocator may have been picking up someone's breathing from under the rubble and not a rescue worker even though the distance of the breathing being recorded was up to 6.2 metres from the LifeLocator, which was implausible. Had the LifeLocator also triggered a "black square" in run mode, presumably Constable Hulsman would have concluded that the signals were being generated by the individuals above ground and proximate to the device.

We now know that there was no one breathing under the rubble. Accordingly, the suggestion has now been made that perhaps the LifeLocator malfunctioned when it did not trigger a "black square" as a result of the assumed movement of the rescue workers and that it is not reliable. This conclusion is simply not supported by the facts.

First, Constable Hulsman admits at page 23034 and elsewhere that he does not know whether or not the data files that were being discussed at the Inquiry and which had been analyzed by GSSI, represent either of the two (2) deployments at Elliot Lake. Accordingly, there is no way to determine whether or not there was any actual movement by any individual within a fifteen (15) metre range of the LifeLocator when Constable Hulsman detected a positive result for breathing. Therefore, there is simply no evidence that the

device failed to detect actual movement at the same time that it detected breathing, as seen by Constable Hulsman.

Second, the algorithms which are used to determine breathing in “run mode” are different than the algorithms which are used to detect and confirm motion. In both cases, motion of some type is involved. The algorithm that detects “breathing” is actually detecting a signal that is periodic or rhythmic, while the algorithm that detects “motion” is detecting a signal that has a large amplitude (e.g., caused by someone moving in a non-periodic manner, such as waving their arms).

As Constable Hulsman confirms in his evidence at page 22959, the device is designed to shield the antennae from above-ground motion and penetrate vertically into the ground to detect sub-surface motion. But not all above-ground signals can be screened out, which is why maintaining the 15 metre clearance area is important.

If an individual, animal, or some other above-ground object was moving in a rhythmic or periodic pattern within 15 metres of the deployment, it is possible that the LifeLocator could detect that motion, made faint by the antenna shielding, and might then interpret such motion as breathing. The LifeLocator is, by design, intentionally sensitive to the faintest breathing-like patterns. This risk of false detection, as “breathing”, of above-ground swaying or other periodic or rhythmic motion within the 15 metre clearance area is specifically covered in the training provided by GSSI.

Further, if any such swaying movement occurred above the ground, it would not have been detected as “motion”, since antenna shielding prevents signal strengths typical of unshielded below-ground motion. Hence, no “black square” would be triggered.

The device is intended to measure and detect two very different types of activity. Accordingly, if the device is being used in a manner contrary to the manufacturer’s directions and a person, animal or other object is moving within 15 metres of the deployment, it is possible for the system to infer rhythmic motion and produce a “red circle” without producing a “black square”.

Therefore, even if Constable Hulsman were describing the correct data from the deployment in question, which is not at all clear, there is a reasonable explanation with respect to why Constable Hulsman detected a red circle without seeing a black square.

With the greatest of respect, any suggestion that a red circle without a black square, in these circumstances, indicates failure of the technology or the LifeLocator is not supported by any proven facts.

### **Proper Training**

Lastly, Commission Counsel asked Constable Hulsman a number of questions with respect to his training. Constable Hulsman confirmed that he was trained with respect to the proper operation and deployment of the LifeLocator in run mode. However, he also testified that he knew from his training and instruction that he was not operating the

LifeLocator as directed by GSSI. The manual, the training DVD, the bold label on top of the unit, and the personal instruction he received all clearly stipulated the importance of maintaining the 15 metre clearance zone. That he chose to operate the unit improperly was not in any way the result of a lack of clear training or documentation. It is also clear that he had tested the unit in training exercises and was pleased with its performance, which could only be true if he maintained the clearance zone during his practice sessions.

Constable Hulsman confirmed that he was also trained with respect to using the LifeLocator device in expert mode. Constable Hulsman confirms at page 22967 and elsewhere that his training would allow him to operate the device and detect large movements in “expert mode”. However, he could not interpret smaller movements which were “so minute you have to be an expert in my opinion to be able to pick out”. This is correct.

GSSI does not expect that operators of its LifeLocator device to be able to “interpret” the minutia of the data plotted in expert mode. The LifeLocator’s main value stems from the robust detection algorithms in run mode, that detect signs of underground breathing that the human eye cannot detect. While the operators of the LifeLocator are trained to use the equipment properly in both “run” and “expert” modes, and are trained only to recognize clear and obvious movement in expert mode, it is not at all realistic to expect that these individuals, who are trained to use this device and several other devices on site, should also be experts with respect to reading and interpreting all of the data generated by the device in “expert” mode.

The LifeLocator has been tested by independent Search and Rescue teams and found to be over 95% accurate. It has been used effectively in rescues around the world: in Japan, Haiti, China, Nigeria and elsewhere. Where the LifeLocator is used, as intended, and pursuant to the manufacturer’s directions, it can and has saved many lives.

## **Conclusion**

GSSI is truly proud and protective of its own reputation. Beyond that, there is an overwhelming public interest in ensuring that no unwarranted conclusions are reached, caused by any finding that the LifeLocator is somehow not reliable and should not be used. If, in the future, officials choose not to use the LifeLocator in situations where people are trapped underground, it would in our client’s respectful submission, potentially cause further human tragedy and loss of life. That of course is contrary to the interests of this Public Inquiry and the public interest generally.

As stated above, there is no evidence that the LifeLocator is unreliable when used properly. It is respectfully submitted that any such finding or suggestion is not factually justified, necessary or appropriate.

If you have any further questions with respect to our client and the LifeLocator, please do not hesitate to contact us. Our client is grateful for the time and effort that the Commissioner and his staff have undertaken to understand and appreciate the complexities

and benefits of the LifeLocator technology. We are confident that that will make for an informed and measured conclusion.

Yours very truly,

**Blaney McMurtry LLP**

A handwritten signature in black ink, appearing to read "Michael J. Penman", with a long horizontal flourish extending to the right.

Michael J. Penman

MJP/gja