Federal Court  Cour fédérale

Date: 20240618

Docket: T-449-17

Citation: 2024 FC 934

Ottawa, Ontario, June 18, 2024

PRESENT: Mr. Justice McHaffie

BETWEEN:

AGI SURETRACK, LLC

Plaintiff/
Defendant by Counterclaim

and

FARMERS EDGE INC.

Defendant/
Plaintiff by Counterclaim

JUDGMENT AND REASONS

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I. Overview

[1] This patent infringement action relates to technology used in precision agriculture. Precision agriculture, or precision farming, uses computer systems to exercise precise control over farming equipment, and to collect and analyze detailed farming data. This allows farmers to plan and implement strategies that optimize yields, efficiency, and profitability.

[2] The patent at issue, Canadian Patent No 2,888,742 [the ’742 Patent], entitled “Farming Data Collection and Exchange System,” pertains to devices and computer systems to harvest and process agricultural data. Of particular importance to the ’742 Patent and to this case are the role of a *relay device* for relaying data from a farming implement, and the way in which the device or system stores and uses information in an *implement profile* to understand the data.

[3] The ’742 Patent is owned by the plaintiff, AGI Suretrack LLC. At the date of trial, the plaintiff and patent owner was Farmobile, LLC, which later merged into AGI Suretrack. I will therefore refer to the plaintiff as Farmobile in these reasons. Farmobile alleges the defendant, Farmers Edge Inc, infringes the ’742 Patent through the manufacture and sale of its CanPlug device and associated FarmCommand computer system. Farmers Edge denies that the CanPlug or FarmCommand ever infringed the patent, but says that even if it did at one point, it has implemented changes to its software such that it is no longer infringing. Farmers Edge also alleges the ’742 Patent is invalid on a number of grounds, and counterclaims for a declaration of invalidity.

[4] The parties disagreed on many aspects of both the patent and other issues, legal and factual. A central disagreement related to the construction of two terms found in each claim of the ’742 Patent: *manufacturer code* and *device class*. Farmobile contends that the skilled reader would give these terms a broad construction, covering any data point or code that identifies a manufacturer and a device. Farmers Edge argues that in the context of the patent, the skilled reader would understand the terms to have the meaning they have in the particular field of network communication on agricultural equipment, namely that set out in an international standard known as ISO 11783. That standard defines, among other things, data structures for communications between pieces of agricultural equipment, which include a specific format for identification that includes a “manufacturer code” and a “device class,” with a series of standard codes being established for each.

[5] The answer to this construction issue lies in a fundamental principle of patent law, namely that a patent is to be read and construed through the eyes of a person who is skilled in the art or field of the patent. As discussed in further detail below, the ’742 Patent is directed not simply to computer devices and systems generally, but to such devices and systems in the field of agriculture. The person skilled in that art would be familiar with and understand the language used in building and programming devices and systems for agricultural use. That person, reading the ’742 Patent in light of their common general knowledge, would see terms used commonly in the art, and in particular in the relevant applicable international standard. In particular, they would see those terms being used in the very way they are used in the art, namely as a means to identify a piece of agricultural equipment communicating over a network, and would see no indication in the ’742 Patent that the inventors intended to use them in any other way. The skilled

reader would understand the terms in accordance with the meaning they have in the art, namely as having the meaning set out in the ISO 11783 standard.

[6] As the parties agree, this conclusion on construction is determinative of all of Farmobile's allegations of infringement. It is conceded that Farmers Edge's CanPlug device and FarmCommand system do not, and never did, include an *implement profile* that defines or contains a *manufacturer code* or *device class* construed in this way.

[7] Farmobile's action is therefore dismissed.

[8] Farmers Edge asserts that some of the claims of the '742 Patent are anticipated by a prior art product offered by John Deere, known as the GreenStar 3 2630. I agree, with respect to most but not all of the claims raised by Farmers Edge. The GreenStar 3 device disclosed and enabled all of the essential elements of 14 of the 19 device claims in the patent. Contrary to Farmobile's arguments, those essential elements do not include, and the anticipation analysis does not involve consideration of, an advantage Farmobile infers from the patent disclosure, namely facilitating "interoperability" between farming implements.

[9] Farmers Edge further alleges that the claims of the '742 Patent that are not anticipated are obvious in light of the prior art and the common general knowledge of the skilled reader of the patent. I again agree. The claims of the '742 Patent that are not anticipated by the GreenStar 3, including those directed to systems rather than devices, contain no inventive differences over the state of the art. The entirety of the '742 Patent is therefore invalid.

[10] Farmers Edge's counterclaim is therefore granted, except as to its claim for declarations as to ownership, which was abandoned at trial.

[11] The parties are to meet and confer in a genuine effort to resolve the issue of costs. If they are unable to do so, they may make submissions in accordance with the schedule set out at the end of these reasons. As a final note to conclude this overview, the Court expresses its regret and apologies to the parties for the time between the completion of trial and the issuance of judgment.

II. Parties and Litigation History

A. *Background to the Action*

[12] Farmobile and Farmers Edge are agricultural technology companies. Farmobile is based in Kansas City, Kansas. Farmers Edge is based in Winnipeg, Manitoba. Both companies offer for sale a device that connects with farming equipment to relay data generated by the equipment, and associated software that allows for analysis and use of the data. Farmobile's device is known as the Passive Uplink Communicator, or PUC. As noted above, Farmers Edge's device is the CanPlug, which is part of its FarmCommand system.

[13] FarmCommand and the CanPlug were initially developed by Crop Ventures, Inc, a Nebraska company founded in 2012 by a technology entrepreneur named Ron Osborne. In April 2013, Crop Ventures hired another agricultural technology entrepreneur named Jason Tatge to be its President and assist in raising capital for the commercialization of FarmCommand and the

CanPlug. Three months later, in July 2013, Mr. Tatge left Crop Ventures after not being paid for two months. Two other Crop Ventures employees, Heath Gerlock and Randall Nuss, also left Crop Ventures in July.

[14] Messrs. Tatge, Gerlock, and Nuss had discussions with a patent attorney over the summer of 2013. In early September 2013, Farmobile was incorporated. On September 23, 2013, Farmobile filed two provisional patent applications in the United States. The ’742 Patent was filed under the Patent Cooperation Treaty on September 22, 2014, claiming priority from the US applications. The inventors of the ’742 Patent are Messrs. Tatge, Gerlock, and Nuss. Mr. Tatge gave evidence at trial.

[15] In January 2015, Farmers Edge acquired Crop Ventures, including the CanPlug and FarmCommand technology. Mr. Osborne joined Farmers Edge, ultimately becoming Chief Technology Officer, the position he held when he left the company in May 2022. Farmers Edge continued, and continues, to develop the FarmCommand system including the CanPlug device, with the first CanPlug being sold in the spring of 2015.

[16] Meanwhile, Farmobile’s PCT application was published on March 26, 2015. The ’742 Patent entered the Canadian national phase on April 17, 2015, and issued on September 15, 2015.

B. *Nebraska Litigation*

[17] The fact that the three inventors of the ’742 Patent were employed at Crop Ventures when it was developing FarmCommand and the CanPlug led Farmers Edge to start litigation in April 2016 in the United States District Court for the District of Nebraska [Nebraska Court; Nebraska Litigation]: Exhibit 65. Farmers Edge claimed, among other things, that the inventors had misappropriated trade secrets, and had breached contracts and duties of good faith and loyalty. It sought, among other things, a declaratory judgment that it was the owner of the US patent application and any applications or patents based on it.

[18] These claims were ultimately determined in favour of Farmobile and the named inventors, largely on grounds of the parties’ agreements, the US “hired to invent” doctrine, Nebraska’s trade secrets statute, and the matters each party claimed to be inventive: *Farmers Edge Inc v Farmobile, LLC*, No 8:16-CV-00191 (D.Neb., May 3, 2018) (Exhibit 76); *Farmers Edge Inc v Farmobile, LLC*, No 8:16-CV-00191 (D.Neb., May 3, 2018) (Exhibits 77); *Farmers Edge Inc v Farmobile, LLC*, No 17-2900 (8th Cir. 2020) (Exhibit 81). Each party in this litigation points to positions taken and evidence filed in the Nebraska Litigation, arguing that the other side is now taking contrary positions. I address these allegations further below.

C. *This Action and Trial*

[19] Farmobile commenced this action in March 2017, asserting that the CanPlug and FarmCommand infringed certain claims of the ’742 Patent. The claims being asserted have changed over time, as the result of both disclosure of Farmers Edge’s software and updates to

that software. In particular, an update to Farmers Edge's software in April 2021, shortly before trial was scheduled to begin, resulted in the trial being adjourned, further amendments being made to the claim and, as discussed below, further expert reports. The result is that by the time of trial, a series of different claims were and are being asserted in respect of different versions of the CanPlug/FarmCommand software over time. These claims, and Farmers Edge's defences to them, are set out in Farmobile's Twice Further Amended Statement of Claim, and Farmers Edge's Thrice Further Amended Fresh as Amended Statement of Defence and Counterclaim, together with the parties' subsequent pleadings thereto.

[20] The inventors' prior employment at Crop Ventures, which grounded the Nebraska Litigation, also prompted Farmers Edge to allege in this action that it was the true owner, or at least *an* owner, of the '742 Patent, and that Mr. Osborne should be identified as an inventor of the patent. However, shortly before trial, Mr. Osborne decided not to participate further in the litigation. Farmers Edge therefore abandoned its allegations regarding ownership and inventorship.

[21] At trial, the Court heard testimony from five lay witnesses: **Mr. Jason Tatge**, CEO of Farmobile and one of the inventors of the '742 Patent; **Ms. Joan Archer**, General Counsel of Farmobile and, after Farmobile's acquisition, of its parent, AGI Digital, and who was also Farmobile's outside counsel in the Nebraska Litigation; **Mr. Wade Barnes**, co-founder of Farmers Edge, and its CEO until shortly before trial; **Mr. Keith Young**, Senior Embedded Team Lead at Farmers Edge; and **Ms. Lori Robidoux**, a former executive of and consultant to Farmers Edge.

[22] Mr. Young and Ms. Robidoux presented their evidence in chief by way of affidavits that were admitted pursuant to Rule 285 of the *Federal Courts Rules*, SOR/98-106, with no objection from Farmobile: Exhibits 116, 134. They were cross-examined on those affidavits at trial. The Court also received evidence by affidavit from **Mr. Tyler Schleicher**, a Manager with Deere & Company, in respect of the availability of certain John Deere products (Exhibit 143); and **Mr. Christopher Butler**, Office Manager at the Internet Archive, with respect to the Internet Archive and the Wayback Machine (Exhibit 144). There was no objection to these affidavits, and Messrs. Schleicher and Butler were not cross-examined.

[23] Patent cases tend to involve, and often require, expert evidence to help the Court understand the patent and the field to which it relates, as well as other issues such as damages or profits. This case was no exception. The parties served some 32 expert reports from ten experts in the course of this litigation, addressing the construction, infringement, validity, and ownership of the ’742 Patent; the economic benefits of patent protection systems; damages and compensation issues including reasonable royalties; and certain issues regarding the law of Nebraska. When issues such as ownership and the Nebraska law questions were withdrawn, five of these reports became unnecessary. The 27 expert reports that were filed as evidence at trial came from eight experts, four on behalf of each party.

[24] Of these, a total of 13 reports were filed by the parties’ two main experts in respect of the construction, infringement, and validity of the ’742 Patent: **Dr. George Edwards** on behalf of Farmobile and **Mr. Aaron Ault** on behalf of Farmers Edge. I address their expertise and evidence in detail below.

[25] Given my conclusions on issues of infringement and validity, I need not address the parties' arguments and expert evidence regarding other issues, including extraterritoriality (the extent to which the '742 Patent might be infringed by a system that is partially within Canada and partially outside Canada), or remedies flowing from infringement. However, I take this opportunity to thank the parties' experts on these issues, **Dr. Aidan Hollis**, **Mr. Ross Hamilton**, **Mr. Marc Vanacht**, **Mr. Leonard Boon**, **Dr. Thomas F. Cotter**, and **Dr. Christine S. Meyer**, for their evidence and for sharing their expertise with the Court.

[26] With this background, I turn to the '742 Patent at issue in this action.

III. Canadian Patent No. 2,888,742

A. *Introduction*

[27] The '742 Patent relates to the collection of farming data using devices attached to farming equipment, and the processing and recording of the data generated during farming operations. Most modern farming equipment has electronic sensors and control units, and can generate data about its operations. The data generated will depend in part on the nature of the farming equipment (*e.g.*, whether it is a planter, fertilizer, sprayer, or harvester). It can include the amount of seed being planted, the amount of fertilizer being applied, the flow rate of sprayed products, the amount of crop harvested, or whether particular nozzles, sections, or blades on the equipment are activated at any given time. Such crop- or farming-specific data is often termed "agronomic data" to distinguish it from mechanical data such as the oil level or tire pressure of the equipment.

[28] Obtaining and processing agronomic data from farming implements for use in precision agriculture was known prior to the ’742 Patent. The ’742 Patent contends that there were shortcomings in available systems, such that they failed to provide farmers with an “easy-to-use, unobtrusive, secure and reliable way to capture, store, share and profit from” the detailed data generated by farming equipment, with the result that such data often goes uncollected. The patent also refers to difficulties in precisely identifying and describing the particular field where a farming operation takes place, and shortcomings in the “common land unit” [CLU] system implemented by the Farms Services Agency of the United States Department of Agriculture [USDA], notably that it only provides perimeters and does not “account for sections of farming land that, for one reason or another, are not currently being used for farming operations.”

[29] Although modern farming equipment can generate agronomic data, not all equipment sends data in the same format. In other words, not every piece of equipment speaks the same “language,” and equipment from different manufacturers will often speak different languages. These data formats or languages are either publicly known or can generally be reverse-engineered. One aspect of the ’742 Patent involves ensuring the right language, or *communication protocol*, is used to translate and analyze the data from the implement.

[30] The ’742 Patent has both “device claims” (Claims 1–19), which claim a *relay device* with certain attributes, and “system claims” (Claims 20–44), which claim a *farming data exchange system* or a *server system* (essentially synonymous terms) with certain attributes. The various claims have different elements. However, each claim involves at least three common aspects: (1) a *relay device* designed for installation on farming equipment, which is the subject of the

device claims and the source of data in the system claims; (2) computer memory that stores (i) an *electronic farming record*, (ii) information about a *farming operation land segment*, and (iii) an *implement profile* that contains a *manufacturer code*, a *device class*, a *version*, and a *communication protocol* for a farming implement; and (3) a computer program that processes and stores collected data. All but six of the claims also specify that the computer program will determine that there is a *match* between the farming implement in use and that in the *implement profile*; and all but five of the claims specify that the computer program will use the data from the implement to determine, among other things, a *travel path* for the implement.

[31] As discussed in greater detail below, the inventors of the ’742 Patent took advantage of their ability to act as “their own lexicographer,” defining in the disclosure of the ’742 Patent a number of terms found in the claims, including terms that are unique to the patent, such as *farming operation land segment* (FOLS) and *travel path*. Nonetheless, many terms used in the claims are not defined and there remain significant disputes between the parties with respect to the construction of the claims and thus the scope of the patent.

B. *Asserted and Impugned Claims*

[32] The claims Farmobile asserts to be infringed have changed over time, in part due to changes Farmers Edge made to its system and software to respond to Farmobile’s infringement allegations. The result is that Farmobile now asserts that:

- prior to April 2021, Farmers Edge’s FarmCommand system infringed Claims 20, 26, 27, 31 to 39, and 41 to 44 [the Asserted System Claims];

- after an update to Farmers Edge's software in April 2021 [April 2021 Update], to the extent it was implemented, the CanPlug infringed Claims 1, 3, 4, 9, 13, and 17 to 19 [the Asserted Device Claims]; and

- after updates to Farmers Edge's software in July 2021, February 2022, and April 2022 [July 2021 Update; February 2022 Update; April 2022 Update], to the extent they were implemented, the CanPlug continues to infringe the Asserted Device Claims, except for Claim 9.

[33] For the entire period after April 2021 to the present, Farmobile also alleges FarmCommand continues to infringe the Asserted System Claims because of the "stand-by utility" of the continued existence of the code either within the FarmCommand system or available in archives.

[34] Farmers Edge denies it ever infringed any of the claims of the '742 Patent. In defence and by way of counterclaim, it also alleges that all of the claims of the '742 Patent are invalid.

C. *Expert Evidence Addressing the '742 Patent*

(1) Overview of the experts and their evidence

[35] Dr. George Edwards filed seven reports in respect of the construction, infringement, and validity of the '742 Patent on behalf of Farmobile. Mr. Aaron Ault filed six on behalf of Farmers Edge. The need for this many reports flowed in large part from the April 2021 and July 2021 Updates to Farmers Edge's software, which resulted in the amendments to the pleadings and

changes to the claims being asserted described above. I introduce these experts now and provide some general comments with respect to their evidence, before reviewing their evidence in greater detail as the need arises below.

[36] **Dr. Edwards** is a computer scientist. He obtained a PhD in computer science from the University of Southern California in 2010, focusing on the analysis of distributed systems and their architecture, with an emphasis on mobile applications and "embedded systems," which are computer and software systems contained within a larger mechanical and electrical system. Dr. Edwards is the President and Principal Computer Scientist at Quandary Peak Research, Inc, a software analysis company he founded in 2012. Dr. Edwards has also lectured in computer science at USC, teaching an undergraduate course and later a graduate-level software engineering course between 2012 and 2017.

[37] Dr. Edwards was qualified to give evidence as an expert in computer science and software engineering with a particular experience and expertise in embedded systems, software analysis, and software architectural development and analysis. Dr. Edwards is not, and does not purport to be, a farmer or to have worked specifically with farming equipment or agricultural software before being retained by Farmobile, although he has designed and programmed software similar to farming information management systems.

[38] The dates of Dr. Edwards' seven reports that were filed as exhibits, with a summary of their subject matter and how I will refer to the reports in these reasons, are as follows:

Date	**Subject Matter**	**Reference**
July 1, 2020	Construction and infringement	Edwards First Report
September 2, 2020	Validity and construction	Edwards Second Report
September 21, 2020	Infringement (proposed non-infringing alternative)	Edwards Third Report
February 15, 2021	Validity (reply)	Edwards Fourth Report
July 16, 2021	Infringement (April 2021 Update)	Edwards Fifth Report
February 28, 2022	Infringement (July 2021 and February 2022 Updates)	Edwards Sixth Report
May 19, 2022	Infringement (reply and April 2022 Update)	Edwards Seventh Report

[39] Farmers Edge objected to the admission of much of the Edwards Sixth Report, arguing that new construction issues raised in that report amounted to an abuse of process and improper case splitting. I address these issues below under the heading "Essentiality and Farmers Edge's objection to the Edwards Sixth Report," beginning at paragraph [215].

[40] **Mr. Ault** is a computer scientist and a farmer. He received a Master of Science in Electrical and Computer Engineering from Purdue University in 2005, specializing in wireless networking and signal processing. He is the co-founder of two agriculture technology concerns: The Qlever Company, LLC, a software development and consulting company; and the Open Agriculture Technology and Systems (OATS) Center at Purdue University, an entity involved in the creation and distribution of open source software and hardware. He is also Vice President at Ault Farms, Inc, his family's farming operation in Indiana. He has actively farmed with this company throughout his life and also developed software the company uses to manage the farm.

[41] Mr. Ault was qualified to give evidence as an active farmer and an electrical and computer engineer having experience and expertise in embedded systems, wired and wireless networking, programming, data analytics, signal processing, and cloud platforms within agriculture, including precision agriculture hardware and software systems.

[42] The dates of Mr. Ault's six reports that were filed as exhibits, with a summary of their subject matter and how I will refer to the reports in these reasons, are as follows:

Date	**Subject Matter**	**Reference**
July 6, 2020	Construction and validity	Ault First Report
September 2, 2020	Infringement	Ault Second Report
September 21, 2020	Validity (reply)	Ault Third Report
April 13, 2021	Infringement (April 2021 Update)	Ault Fourth Report
July 30, 2021	Infringement (reply re April 2021 Update)	Ault Fifth Report
April 28, 2022	Infringement (July 2021 and February 2022 Updates)	Ault Sixth Report

[43] In my view, both Dr. Edwards and Mr. Ault sought to perform their role as expert witnesses to the best of their ability. Dr. Edwards, not surprisingly, brought the perspective of the computer scientist to his role, while Mr. Ault's perspective included that of the farmer. As will be seen below, this perspective affected certain aspects of their reading of the '742 Patent, particularly as it related to the terms *manufacturer code* and *device class*. While each witness' evidence had limitations, and each took positions that I do not adopt, each provided helpful evidence to assist the Court in being able to put itself in the position of the skilled reader for the purposes of construing the patents and assessing the parties' respective arguments on infringement and invalidity: *Whirlpool Corp v Camco Inc*, 2000 SCC 67 at para 57.

(2) Farmobile's arguments regarding Mr. Ault

[44] Farmobile argues I ought to prefer Dr. Edwards' evidence over that of Mr. Ault as a whole because: (a) Mr. Ault's evidence was results-oriented and that of an advocate rather than an independent expert; (b) Mr. Ault was in a conflict of interest; and (c) Mr. Ault's company had a consulting agreement with Farmers Edge that he did not disclose. None of these arguments is persuasive. With respect to the first argument, I did not find Mr. Ault's evidence, either through his reports or in his testimony, to be that of an advocate. While I do not accept his evidence in its entirety, or that of Dr. Edwards, I see no basis for a blanket preference for Dr. Edwards' evidence. Indeed, as discussed below, there were occasions on which inconsistencies in Dr. Edwards' evidence raised such concerns.

[45] Nor do I see Mr. Ault's involvement with the OATS Center, which promotes open source software in the agricultural area, as creating a conflict with his role in reading and construing the '742 Patent, describing the art and knowledge in the field, and considering whether Farmers Edge infringed the patent. Farmobile refers to one of the OATS Center's funders, a large agriculture company that is described as a competitor of both Farmobile and Farmers Edge. The fact that such a company acts as one of many sponsors of the university center where Mr. Ault works does not, in my view, raise a concern about conflict or bias. In any event, at no time in reviewing Mr. Ault's evidence or hearing his testimony did I see any indication that his opinions on relevant matters were or could have been in any way improperly shaped by his employment with Purdue or the OATS Center.

[46] Finally, Farmobile made heavy weather in cross-examination of a 2016 consulting arrangement between Mr. Ault's company, Qlever, and Farmers Edge, suggesting that the failure to disclose it in his report constituted a breach of the Code of Conduct for Expert Witnesses. I disagree. Paragraph 3(k) of the Code of Conduct requires an expert to include in their report "particulars of any aspect of the expert's relationship with a party to the proceeding or the subject matter of his or her proposed evidence that might affect his or her duty to the Court": *Federal Courts Rules*, Schedule (Rule 52.2), s 3(*k*). Given the timing, value, and subject matter of the consulting in question, which appears to have been undertaken by a colleague of Mr. Ault and not by him, I can see no basis to conclude that it was of a nature that it might affect Mr. Ault's duty to the Court. While disclosure of the arrangement might have saved all parties some time in cross-examination and reply evidence, there is no merit in Farmobile's contention that Mr. Ault not disclosing the arrangement in his report undermines his evidence.

[47] I note that both parties also argued that their expert ought to be preferred over the other based on their backgrounds and expertise, and the consistency of their evidence with the '742 Patent. I will address the experts' particular opinions below, but conclude that this is not a case in which one expert's view ought to simply be adopted on every issue because of concerns about credibility, independence, or advocacy.

D. *The Person of Ordinary Skill in the Art*

(1) Principles

[48] A patent is to be read through the eyes of a person of ordinary skill in the art, often termed the POSITA, the skilled person, or the skilled reader. That hypothetical person, who may be an individual or a team of individuals, is not inventive, but has the "ordinary skill and knowledge of the particular art to which the invention relates" and is reasonably diligent in keeping up with advances in that field: *Free World Trust v Électro Santé Inc*, 2000 SCC 66 at para 44, citing Harold G Fox, *The Canadian Law and Practice Relating to Letters Patent for Inventions*, 4th ed (Toronto: Carswell, 1969) at p 184; *Whirlpool* at paras 70–71, 74. They are acquainted with the surrounding circumstances as to the state of the art and with the technical meaning in that art that any particular word or words may have: *Whirlpool* at para 53.

(2) The skilled reader of the '742 Patent

[49] The parties presented slightly different descriptions of the skilled reader of the '742 Patent. Each party recognized the POSITA would be skilled in both the technology aspects (device and system design and programming) and the precision agriculture aspects of the '742 Patent. However, Dr. Edwards put greater emphasis on the technology aspect, while Mr. Ault put more emphasis on the precision agriculture aspect.

[50] Dr. Edwards suggested the POSITA would be either an application-server programmer or an embedded systems engineer (depending on the claims) with a "working knowledge of basic

precision agriculture concepts" but no more than a "basic familiarity" or "basic understanding" of the area: Edwards First Report, para 21; Edwards Second Report, para 10; Transcript, Day 3, p 3. He suggested the POSITA would have a bachelor's degree in computer science or a related field plus about three years of work experience in programming or engineering precision agriculture applications. Alternatively, they could have less education but an equivalent additional amount of work experience.

[51] Mr. Ault described the POSITA as someone skilled in designing and building precision agriculture devices and systems in particular: Ault First Report, para 62; Transcript, Day 8, p 35. They would thus have knowledge and experience in both the precision agriculture aspects of the '742 Patent and on the software and networking communications aspect. Mr. Ault did not define the POSITA's specific education or work history, but said they would have education and experience in heavy machinery telematics, agricultural practice, networking and communication protocols specific to modern farming machinery, and software development.

[52] The main difference between these descriptions of the POSITA is in their degree of knowledge of, experience in, and familiarity with precision agriculture and precision agriculture devices and systems. Dr. Edwards says the POSITA would have a working knowledge or basic familiarity of the area, while Mr. Ault says the POSITA would be someone knowledgeable and skilled in designing such devices and systems. As discussed below, Dr. Edwards did not deny that the POSITA would have the knowledge attributed to them by Mr. Ault. However, it was clear that Dr. Edwards views the POSITA's perspective as primarily that of the computer scientist or software engineer generally, rather than that of one skilled in the art of computer

systems and devices on agricultural equipment in particular. While this difference may be subtle, it is important in assessing the skilled person's common general knowledge [CGK] and how they would read and understand the patent.

[53] In my view, Mr. Ault's assessment is more consistent with the art described in the '742 Patent. The '742 Patent states that its technical field is "systems and methods for capturing farming operation data in real time using passive data collection devices attached to farming equipment while the farming equipment is used to perform the farming operations, and then processing and sharing the farming operation data via an online farming data exchange system or server." In other words, the field is computer systems and devices relating to agriculture in particular and not simply embedded systems and software engineering that happens to relate to agriculture.

[54] This is confirmed in the patent's description of the background art, which relates to precision farming, contemporary farming machines, and the computer systems and controllers that are on such machines. This includes discussion of the relay of agronomic data from farming implements, and the value of capturing and storing this data, with reference to "conventional precision farming techniques, computer systems and related technology."

[55] I conclude the "particular art to which the invention relates" is that of software systems and devices for network communication on, and the collection and processing of data from, agricultural equipment. The person of ordinary skill in this art would have more than a working knowledge of precision agriculture concepts. In other words, they would not simply be a

software engineer who has a "basic familiarity with the [domain] for which they are developing software," as Dr. Edwards suggests: Transcript, Day 3, p 3. They would be skilled, knowledgeable, and experienced in the area of devices and networking on agricultural equipment in particular.

[56] I note parenthetically that I cannot accept Dr. Edwards' contention that the skilled person for Claims 1 to 19 of the '742 Patent would be different from the skilled person for Claims 20 to 44: Edwards Second Report, paras 7–14. This Court has held on a number of occasions that the patent is read as a whole and "[t]here cannot be different skilled persons for different claims": *Teva Canada Limited v Janssen Inc*, 2018 FC 754 at para 236, citing *Janssen Inc v Teva Canada Limited*, 2015 FC 184 at para 92; *Angelcare Canada Inc v Munchkin, Inc*, 2022 FC 507 at para 376. In any event, Dr. Edwards' contention did not affect his view of the CGK held by the skilled reader, and my rejection of it therefore does not impact my analysis.

E. *The Common General Knowledge*

(1) Principles

[57] The skilled reader reads a patent with an appreciation of the CGK in the art to which the patent relates: *Cobalt Pharmaceuticals Company v Bayer Inc*, 2015 FCA 116 at para 14. The content of the CGK is therefore relevant to the purposive construction of the claims, as well as to the analysis of obviousness: *Biogen Canada Inc v Pharmascience Inc*, 2022 FCA 143 at para 61.

[58] As the Federal Court of Appeal has recently confirmed, the CGK is "the knowledge generally known by the skilled person at the relevant time, and includes what the skilled person may reasonably be expected to know and be able to find out": *Gemak Trust v Jempak Corporation*, 2022 FCA 141 at para 93, aff'g 2020 FC 644 at para 97. What the skilled person may "be able to find out" does not cover all prior art or everything the person might obtain through a reasonably diligent search: *Gemak* at paras 94–100. Rather, knowledge only becomes part of the CGK where it is "generally known and accepted without question by the bulk of those who are engaged in the particular art; in other words, when it becomes part of their common stock of knowledge relating to the art": *Gemak* at para 96, citing *British Acoustic Films Ltd v Nettlefold Productions* (1936), 53 RPC 221 at p 250.

(2) The CGK of the POSITA

[59] Dr. Edwards and Mr. Ault generally agreed on the CGK of the POSITA, although again the subtle difference in their description of the POSITA resulted in different emphasis. Both experts set out in their First Reports areas of general knowledge the POSITA would have, notably with respect to precision agriculture. In his First Report, Mr. Ault set out his understanding of the CGK in more detail than Dr. Edwards did in his First Report: Ault First Report, paras 34–38, 64–79, 90–151; Edwards First Report, paras 25–38. In his Second Report, Dr. Edwards largely agreed with Mr. Ault's statements regarding the CGK, while noting some areas where he considered Mr. Ault's statements unsupported or unverifiable: Edwards Second Report, paras 18–35.

[60] It is unnecessary to set out the entirety of the CGK presented by the experts. I am satisfied the evidence shows the following information and knowledge formed part of the CGK on both September 23, 2013 (the priority date, relevant to the question of obviousness), and March 26, 2015 (the date of publication, relevant to claims construction). The experts agreed there were no relevant differences in the CGK between these dates: Ault First Report, para 89; Edwards Second Report, paras 15–17. I will summarize the evidence presented regarding the CGK under three primary areas: (a) precision agriculture and modern farming equipment; (b) the ISO 11783 standard; and (c) mapping and farm management information systems/software.

(a) *Precision agriculture and modern farming equipment*

[61] I described the concept of precision agriculture at the outset of these reasons. The precision agriculture industry arose in the 1990s. It sought to obtain and use detailed information regarding farming operations to permit farmers to plan and make farming decisions at a "per-plant" level, something that had become difficult as large-scale mechanization replaced manual labour in agriculture. Precision agriculture relies on farming equipment with electronics and sensors that allow precise control of the equipment and generate detailed agronomic information. Most modern farming equipment includes such electronics.

[62] The electronics on farming equipment are connected by an onboard network called a "message bus" or "communications bus." The message bus on farming equipment consists essentially of twisted wires that devices can connect to via a plug. Electronic messages are sent over the bus allowing the electronic devices on the equipment—known as "electronic control units," or ECUs—to communicate, and a component connected to the bus can receive these

messages. The information carried over the bus depends on the type of equipment: on a sprayer, it might include an instruction from the operator to turn a particular nozzle on, or a message from a sensor indicating how much was being sprayed. This data could be displayed on a screen in the cab of the equipment, allowing the operator to view the data and control the equipment. The collection, communication, and use of data from machinery is sometimes termed "telematics."

(b) *The ISO 11783 standard*

[63] Networking standards are created and published to define protocols that allow electronic components to interpret data and communicate with one another. The parties agree that a networking standard published by the International Organization for Standardization known as ISO 11783 would have been part of the CGK of the POSITA. The ISO 11783 is entitled "Tractors and machinery for agriculture and forestry—Serial control and communications data network." A document of over 700 pages, the ISO 11783 standard consists of multiple parts (numbered ISO 11783-1, ISO 11783-2, etc.), which have dates of first publication between 2001 and 2009: Ault First Report, Schedule 3T.

[64] The ISO 11783 standard sets out network and data protocols for use in agricultural equipment, defining the message bus—generally known as the ISOBUS—and how devices connected to the bus should send and interpret messages. As set out in the introduction to the standard, its purpose "is to provide an open, interconnected system for on-board electronic systems," and is "intended to enable electronic control units (ECUs) to communicate with each other, providing a standardized system": Ault First Report, Schedule 3T(i), p v.

[65] By doing so, the ISO 11783 standard seeks to address the question of “interoperability,” that is, the ability of components, particularly components from different sources, to communicate so they can be used together. This is a challenge in the field of computing generally, but specifically one that can arise in agricultural machinery, since a machine made by one manufacturer may send agronomic and other data in a different format than one made by a different manufacturer. Without some way of understanding the data being transferred, equipment made by different manufacturers could not be efficiently used together.

[66] The ISO 11783 standard provides standards for the layers of the onboard network, including the physical layer (the wires, connectors, and power sources comprising an ISOBUS) and the data link layer (defining the format of messages used for communication over the ISOBUS), as well as standards for network management and equipment connecting to the network. Part 1 of the standard (ISO 11783-1), titled “General standard for mobile data communication” gives a general overview of the standard, while the remaining parts provide further detail on different aspects of the standard.

[67] The message format in the ISO 11783 standard includes a header that sets out, among other things, the kind of message it is, defined by its “parameter group number,” or PGN. The PGN identifies a particular “parameter group,” or PG, which is the identification of the data in a message. The standard assigns PGNs to numerous PGs that are open, standard types of messages.

[68] The ISO 11783 standard also reserves PGNs for proprietary or non-standard message types. These allow manufacturers to design their equipment to send messages over the ISOBUS in their own format, not defined by the ISO 11783 standard. Farm equipment manufacturers often design their equipment to use such proprietary message formats, which puts a limitation on the interoperability promise of the ISO 11783 standard. To understand the information sent from such equipment, a user or system must know the format of the data. This they can do by having compatible equipment (*e.g.*, a computer system manufactured by the same manufacturer), by obtaining a license to that information from the manufacturer if available, or by reverse engineering the PGN. Mr. Ault and Dr. Edwards agree that the ability to reverse engineer proprietary messages to determine their format was commonplace prior to 2013 and part of the CGK of the POSITA.

[69] The ISO 11783 standard includes definitions for numerous terms used throughout the document, and discusses and specifies requirements for various components. I set out here in glossary form some of the important terms referred to by the experts as relevant to the discussion in the ’742 Patent:

> **address claim message**: a message sent by a device on the bus to claim an address for itself. Absent a conflicting address claim message, the device can use the claimed address. An address claim message includes the NAME field.
>
> **farm management information system [FMIS]**: an office computer system used by a farmer that includes software for farm management such as bookkeeping, payroll, resource management for machines, products, workers, field management, geographical information system, decision support systems and task management.

NAME: an eight-byte (64-bit) field or entity that identifies and indicates the control functions of an ECU. It contains a series of fields such as the industry group, device class, function, a manufacturer code, and an identity number.

object pool: the collection of **objects** (formatted pieces of data) that defines the operator interface or device description for an implement.

task controller [TC]: an ECU that can control equipment or log data while the equipment performs a task. It is responsible for the sending, receiving, and logging of process data.

virtual terminal [VT]: an ECU consisting of a graphical display screen and input controls, allowing an operator to view information, retrieve data, and send commands to equipment connected to an ISOBUS. The equipment in turn can send messages to the virtual terminal, indicating what objects (such as images, numbers, text, or buttons) to display and where to display them on the screen of the virtual terminal, *i.e.*, its virtual terminal object pool.

[70] ISO 11783-1 includes a series of annexes that set out standard values for PGNs, as well as the various fields in the NAME, such as the industry group (*e.g.*, the value 1 for "On-highway equipment" or 2 for "Agriculture and forestry equipment"); the device class (*e.g.*, for agriculture equipment, the value 5 for "Fertilizers" or 6 for "Sprayers"); the function parameter (*e.g.*, for sprayers, the value 128 for "Fertilize Rate Control" or 134 for "Product Level"); and the manufacturer code (*e.g.*, the value 7 for "Case Corp." or 12 for "Deere & Company, Precision Farming"). The identity number, or "unique identifier," is a unique number assigned by the

manufacturer to each individual piece of equipment. The structure and various fields within the NAME field, together with examples of NAME construction, are set out in greater detail in ISO 11783-5, titled “Network management”: Ault First Report, Schedule 3T(v).

[71] With reference to the foregoing terms, when a device is attached to the ISOBUS and turned on, it sends an address claim message, which is transmitted over the bus. The address claim message includes the NAME field, which includes the device class, function, and manufacturer code specified by the ISO 11783 standard. Unless there is a conflicting address claim message, the other devices on the bus know that the connected device can use the address it claimed. They will also know the manufacturer and class of the device. If a device identifies itself as a virtual terminal, other devices, such as a sprayer, will send user interface information in the form of a virtual terminal object pool, telling the virtual terminal how to display information coming from the sprayer. When the sprayer then sends data such as its spray rate, this will be displayed on the virtual terminal in accordance with the virtual terminal object pool sent by the sprayer. An implement may have multiple versions of its virtual terminal object pool, with each object pool version being assigned an identifying number by the manufacturer. On startup, the implement will send a “Get Version” message, which tells the virtual terminal which version of the implement’s virtual terminal object pool to load.

[72] Aspects of the ISO 11783 standard are based on an earlier standard related to communications in heavy machinery, known as SAE J1939 or simply J1939, which the experts similarly agree would form part of the CGK. The SAE J1939 standard specifies protocols for a message-bus based communication network used in vehicles known as a “Controller Area

Network" or CAN. A message bus conforming to the SAE J1939 standard is known as a "CAN bus." The SAE J1939 standard and the ISO 11783 standard are used by most modern farming machinery.

[73] Dr. Edwards agreed the POSITA would have a "basic understanding" of ISO 11783 and the earlier SAE J1939: Exhibit 31, p 16; Transcript, Day 3, pp 5–6. However, when asked to admit that the POSITA would know those standards establish and provide definitions for the terms "manufacturer code" and "device class," he was unwilling to do so. He asserted the standards are "very lengthy" and that the POSITA would not have "memorized all the fields of all the messages" in the standards. He ultimately suggested the POSITA would "not necessarily know whether manufacturer code, for example, was one of those parameters without consulting the standard": Transcript, Day 4, pp 57–60, 62. I agree with Farmers Edge that Dr. Edwards' responses were inconsistent with his Second Report, in which he agreed with Mr. Ault that the CGK included knowledge of address claim messages and the NAME field, including the manufacturer code and device class parameters in the NAME field, and stated that the skilled person would "know those terms": Edwards Second Report, paras 23, 76, 151.

[74] The ISO 11783 standard is the international standard applicable to communications on agricultural equipment, published long before the relevant date. I am satisfied based on the evidence and my conclusions regarding the description of the skilled reader that their CGK would include sufficient knowledge of the ISO 11783 standard to be well familiar with its contents and concepts, including basic terms and definitions. While Dr. Edwards is no doubt right that the POSITA would not and could not have the entire ISO 11783 standard memorized,

they would not have to consult the standard to recognize and understand terms such as ECU, virtual terminal, object pool, address claim message, NAME, manufacturer code, or device class.

[75] I note that even on Dr. Edwards' definition, the POSITA would have three to five years of work experience in the area of precision agriculture applications, and would be sufficiently familiar with the area to be able to reverse engineer proprietary message data sent on farming implements: Edwards First Report, paras 21, 27; Edwards Second Report, paras 10, 20. It is incongruous that a person who has been working in the field for this long and has such knowledge would not also have a ready working knowledge of terms used in the international standard applicable to communications in the field.

(c) *Mapping and farm management information systems/software*

[76] As Mr. Ault set out in his First Report, monitors in agricultural machines were able to produce maps from data generated during farming prior to September 2013. Using data from farming implements, the monitor could create and display an "as-harvested" map that, for example, showed harvest yield from various parts of a field as a combine travelled over it, with colour coding for the quality of the yield, or an "as-applied" map that displayed fertilizer application rates. Farmers could also develop "prescription maps" that were designed and prepared before the farming operation and told the machine what to do in various parts of a field, such as apply more or less fertilizer depending on what was known about the soil in different parts of the field.

[77] The data generated during these farming operations could also be transferred for use in farm management information software [FMIS], a term defined in the ISO 11783 standard as set out above (the abbreviation FMIS is used interchangeably to refer to "farm management information software" and "farm management information system"). FMIS systems are used by farmers to store and process the various data relevant to the management of the farm including, for present purposes, field management and geographical information.

[78] Early FMIS systems used a portable storage medium such as a flash memory card, which was physically attached to the monitor on the farm equipment. The data on the card could then be transferred to another computer for later use, further analysis, and/or printing using the FMIS. As cellular and other wireless technologies developed, data transfer by these methods was implemented in FMIS systems.

[79] For completeness, I note that in his First Report, Dr. Edwards stated that the POSITA would also be aware of two trends in the broader computing industry, namely the emergence of the "Internet of things" and an increase in the ability to analyze large volumes of data generated by sensors, known as "big data." Mr. Ault did not disagree with this, but neither expert spent much time on these issues or how they related to issues relevant at trial, other than the question of essentiality. While I accept that the POSITA would have had knowledge of these trends, I need not address them in detail.

F. *Claims Construction*

(1) Principles

[80] As the Federal Court of Appeal recently reiterated, interpreting a patent is like interpreting a regulation: *Biogen* at para 72, citing *Whirlpool* at para 49(e); *Interpretation Act*, RSC 1985, c I-21, s 2(1) (“enactment”; “regulation”). As with regulatory interpretation, patent claims construction is conducted in accordance with a series of principles and rules, designed to bring rigour, predictability, and fairness to the process: *Free World Trust* at para 31. The claims of a patent, construed in accordance with those principles, define the monopoly protected by the patent: *Patent Act*, RSC 1985, c P-4, s 27(4).

[81] The claims of a patent are to be construed:

a) through the eyes of a POSITA, in light of their CGK, at the date of publication: *Tearlab Corporation v I-MED Pharma Inc*, 2019 FCA 179 at para 32; *Free World Trust* at paras 31(e), 51, 53;

b) adhering to the language of the claims, read and understood in the context of the patent as a whole including its disclosure and other claims, but without using the disclosure to enlarge or contract the monopoly as expressed in the claims: *Biogen* at paras 71–73; *Tetra Tech EBA Inc v Georgetown Rail Equipment Company*, 2019 FCA 203 at para 86; *Tearlab* at paras 31, 33; *Whirlpool* at paras 49(e)–(f), 52, 54; *Free World Trust* at para 31(a)–(b); *Viiv Healthcare Company v Gilead Sciences Canada, Inc*, 2021 FCA 122 at paras 57–60;

c) in an informed and purposive way, in the sense the inventor is presumed to have intended and sympathetic to accomplishing the inventor's purpose, with a mind willing to understand and not one desirous of misunderstanding: *Tearlab* at para 31; *Free World Trust* at paras 31(c), 44, 51; *Whirlpool* at para 49(c);

d) in a neutral manner, neither benevolent nor harsh, that achieves a result reasonable and fair to both patentee and public, and endeavouring to give effect to a construction that affords the inventor protection for that which they have actually in good faith invented, if the language of the claims can reasonably bear it: *Whirlpool* at para 49(g), citing *Consolboard Inc v MacMillan Bloedel (Sask) Ltd*, 1981 CanLII 15 (SCC), [1981] 1 SCR 504 at pp 520–521; *ABB Technology AG v Hyundai Heavy Industries Co, Ltd*, 2015 FCA 181 at paras 37, 42–45;

e) with the goal of identifying the essential elements of the subject-matter as claimed, derived from an informed interpretation of the claims: *Biogen* at para 74; *Free World Trust* at paras 31(e), 51–60;

f) before considering infringement or validity, and adopting a single construction for all purposes without regard to whether the construction will affect those issues, although the Court may properly focus on determinative areas of disagreement, and need not construe elements over which there is no dispute, particularly in dependent claims: *Whirlpool* at paras 43, 49(a)–(b); *Tearlab* at para 34; *Seedlings Life Science Ventures, LLC v Pfizer Canada ULC*, 2021 FCA 154 at para 22; *Cobalt* at para 83; *Swist v MEG Energy Corp*, 2022 FCA 118 at paras 21–23, 30–31; and

g) recognizing the inventor's ability to define words used in the claims: *Biogen* at para 73; *Whirlpool* at paras 52, 54; *Kramer v Lawn Furniture Inc*, [1974] FCJ No 100, 13 CPR (2d) 231 at para 16.

[82] As discussed below in further detail, the issue of essentiality—whether an element in a claim is essential or not—arises in this case as it relates to the most recent versions of Farmers Edge's software. I will address relevant principles governing the determination of essentiality when addressing the parties' arguments on the issue, commencing at paragraph [232] below.

[83] Other specific principles of claims construction may also come into play. One of these is the principle of claim differentiation, which creates a rebuttable presumption that a dependent claim is not redundant over a claim from which it depends: *Halford v Seed Hawk Inc*, 2004 FC 88 [*Halford (FC)*] at paras 91–94, rev'd in part on other grounds, 2006 FCA 275 [*Halford (FCA)*]; *Eli Lilly Canada Inc v Apotex Inc*, 2020 FC 814 [*Lilly Tadalafil*] at paras 111–113; *Apotex Inc v Lundbeck Canada Inc*, 2010 FCA 320 [*Apotex Escitalopram*] at paras 109–110. The limitations of a dependent claim should therefore not be read into the claim from which it depends: *Halford (FC)* at para 93; *Apotex Inc v Shire LLC*, 2021 FCA 52 [*Shire*] at para 89. As a corollary, independent claims must be construed in a manner consistent with their dependent claims: *Halford (FC)* at paras 95–97. These principles may be applied in comparing similar clauses in claims, even if the claims have other differences, depending on the case: *Seedlings* at para 21. They may also be applied between independent claims: *Lilly Tadalafil* at para 111, citing *Camso Inc v Soucy International Inc*, 2019 FC 255 at paras 103, 186–190. Ultimately, however, the presumption of claim differentiation does not overcome a purposive interpretation

of the claim: *Bridgeview Manufacturing Inc v 931409 Alberta Ltd (Central Alberta Hay Centre)*, 2010 FCA 188 at para 33; *Apotex Escitalopram* at para 110.

[84] Another principle involving the comparison of claims in construction is the presumption of claim consistency, namely that the same words be given the same meaning throughout the claims and within a claim: *Nova Chemicals Corporation v Dow Chemical Company*, 2016 FCA 216 [*Nova (FCA)*] at para 82, leave to appeal ref'd 2017 CanLII 21418 (SCC); *Johnson & Johnson Inc v Boston Scientific Ltd*, 2008 FC 552 at para 212. Again, this presumption is not inflexible and the words of a claim must take colour from their context: *Nova (FCA)* at para 83.

[85] The POSITA is not only skilled in their technical area, but is also skilled in reading patents as legal documents and is taken to know the rules, presumptions, and conventions of patent drafting: *Teva Canada Ltd v Pfizer Canada Inc*, 2012 SCC 60 at para 80; *Biovail Pharmaceuticals v Canada (Ministry of National Health and Welfare)*, 2005 FC 9 at para 22. On such issues, which relate more to the legal rules of regulatory interpretation than the particular art or science to which the patent relates, the Court does not require technical expert evidence.

[86] Farmobile submits there is a further general principle that if more than one construction can be reasonably reached, that which upholds the validity of the patent should be favoured. In support of this proposition, it cites *Pollard Banknote*, a decision of Justice Locke, then of this Court: *Pollard Banknote Limited v BABN Technologies Corp*, 2016 FC 883 at para 77, citing *Letourneau v Clearbrook Iron Works Ltd*, 2005 FC 1229 at paras 37–38 and *Pfizer Canada Inc v*

Canada (Minister of Health), 2005 FC 1725 at para 52. I do not accept Farmobile's submission, for two reasons.

[87] First, subsequent to *Pollard Banknote*, the Federal Court of Appeal has rejected the contention that the Court should adopt "any arguable interpretation" simply because it favours validity: *ABB Technology* at paras 34–51, aff'g 2013 FC 97 at para 29. Indeed, the Federal Court of Appeal, with Justice Locke writing for the Court, has recently confirmed that courts are "restrained from construing claims based on whether their construction will result in invalidity" [emphasis added]: *Seedlings* at para 22. This is entirely consistent with the direction in *Whirlpool* and *Free World Trust* that construction should be undertaken "without reference to specific issues of validity" and without "an eye to the prior art in respect of validity to avoid its effect": *Whirlpool* at paras 43, 49(a); *Free World Trust* at para 19.

[88] Conversely, the general proposition submitted by Farmobile is directly contrary to the principle that construction is antecedent to assessing validity, an inconsistency Justice Locke noted in *Pollard Banknote* itself: *Whirlpool* at para 43; *Pollard Banknote* at paras 77–78. This principle precludes an approach that "favours" a construction based on whether it will uphold the validity of the patent. Rather, only the narrower proposition from *Consolboard* governs, namely that where patent language can bear more than one equally plausible meaning, a reasonable view should be taken to afford the inventor protection for what they in good faith invented: *ABB Technology* at para 45, citing *Consolboard* at p 521; *Whirlpool* at para 49(g).

[89] Second, even before *ABB Technology*, the cases of this Court that applied the principle Farmobile espouses, such as *Letourneau* and cases following it, have only done so in addressing ambiguity as a ground of invalidity: *Letourneau* at paras 27, 36–38; *Pfizer* at paras 52–53; *Uview Ultraviolet Systems Inc v Brasscorp Ltd*, 2009 FC 58 at paras 230, 233; *Fournier Pharma Inc v Canada (Health)*, 2012 FC 741 at paras 141–142. Read in this context, the principle simply means that the Court will endeavour to give meaning to the claims of a patent rather than concluding that it is ambiguous and thus invalid. This accords with the purposive approach to interpretation and the principle that claims are read with a "mind willing to understand": *Whirlpool* at para 49(c). Applying *Letourneau* beyond the area of ambiguity would take it beyond its scope.

[90] I note too that the original source of the principle is the Supreme Court of Canada's decision in *Western Electric Co, Inc, et al v Baldwin International Radio of Canada*, [1934] SCR 570: see *Letourneau* at para 38; *Unilever PLC v Procter & Gamble Inc*, [1995] FCJ No 1005 (CA) at para 23, citing *Consolboard* at pp 520–521. In *Western Electric*, the Court does appear to consider the principle to include attacks based on novelty and overbreadth: *Western Electric* at p 574. However, the Supreme Court in *Whirlpool* and *Free World Trust* relied on *Western Electric* only for support of the purposive approach to construction, without adopting the contention that the Court should favour a construction that avoids invalidity on grounds of, for example, anticipation: *Whirlpool* at paras 49(g), 52; *Free World Trust* at paras 43, 58. Rather, the Supreme Court adopted the contrary proposition, that construction should be undertaken without reference to specific issues of validity. To the extent that *Western Electric* stands for a broader proposition, it must be considered to be overtaken by *Whirlpool*, *Free World Trust*, and

jurisprudence that confirms those cases: see, *e.g.*, *AstraZeneca Canada Inc v Apotex Inc*, 2017 SCC 36 at para 31; *ABB Technology* at paras 35–38.

[91] With these principles in mind, I turn to the construction of the claims of the ’742 Patent. The issues in this case turn primarily on the construction of the three independent claims (Claims 1, 20, and 38), including arguments regarding the construction of those claims based on dependent Claims 2 and 21. I will address the construction of these claims in detail before briefly addressing the remaining independent claims.

[92] A word about the order in which the claims were addressed. Many of the terms in Claims 1 to 19 (the device claims) are also found in Claims 20 to 44 (the systems claims). When Dr. Edwards prepared his First Report, related to construction and infringement, Farmobile only asserted the Asserted System Claims. Dr. Edwards therefore first addressed construction with reference to the system claims, rather than the device claims. Farmobile followed this approach in its closing submissions. Mr. Ault, however, began with the device claims, and Farmers Edge followed this approach in its closing submissions.

[93] There was no dispute that terms should bear the same meaning in both the device claims and the system claims. Nothing turns on whether the device claims or systems claims are addressed first. I will address Claim 1 first simply because it is the first claim at issue. In doing so, I will often refer to Dr. Edwards’ evidence, and Farmobile’s arguments, that were first presented in addressing the same terms as they appear in the system claims, such as Claim 20.

(2) Claim 1

[94] Claim 1 of the ’742 Patent is the independent device claim from which all of the other device claims depend. It reads as follows, with the terms discussed below underlined:

> 1. A relay device for tracking farming operations for a farming business, comprising:
>
> (a) a microprocessor;
>
> (b) a bus connector for connecting the relay device to a message bus on a farming vehicle or farming implement, wherein the message bus is configured to carry messages generated by the farming vehicle or the farming implement while the farming vehicle and the farming implement are used to perform the farming operation;
>
> (c) a global positioning system receiver that receives position and time signals from space-based satellites while the farming operation is performed;
>
> (d) a memory storage area that stores (i) an electronic farm record for the farming business, (ii) descriptive information about a farming operation land segment associated with the farming business, and (iii) an implement profile defining, for a known farming implement, a known manufacturer code, a known device class, a known version and a known communication protocol; and
>
> (e) an application program comprising programming instructions that, when executed by the microprocessor, will cause the microprocessor to automatically
>
> (i) extract content from one or more messages transmitted on the message bus and use the extracted content to determine that there is a match between the farming implement used to perform the farming operation and the known farming implement of the implement profile,
>
> (ii) use the extracted content, the position and time signals and the known communication protocol defined by the implement profile for the known farming implement to determine a set of operating events and a travel path for the farming operation,

> (iii) use the set of operating events, the travel path and the descriptive information stored in the memory storage area to determine that the farming operation occurred on the farming operation land segment, and
>
> (iv) record the farming operation and the descriptive information for the farming operation land segment in the electronic farm record.

[95] As can be seen from its structure, Claim 1 claims a *relay device* for tracking *farming operations* for a *farming business* that comprises five attributes or elements, lettered (a) to (e), four of which have sub-elements. Neither party suggested that a skilled reader would understand the term "comprising" to mean anything other than its usual meaning in patent construction, namely "including, but not limited to": *Nova (FCA)* at paras 81–83.

[96] By way of high-level summary, on which the parties essentially agree, Claim 1 claims a *relay device* that can be connected to the *message bus* on farming equipment while it is being used in farming. The device has memory that stores an *electronic farm record* (EFR), a description of a *farming operation land segment* (FOLS), and certain information about a *known farming implement*. The software on the device is able to take *content* from one or more messages received on the message bus, and use it to determine that there is a *match* between the *farming implement* being used to farm and the *known farming implement*. Having determined there is a *match*, the software uses what it knows about how the *known farming implement* communicates to take information from the message content and determine certain things about the farming that is happening, notably a *travel path*, and saves the information in the *electronic farm record*.

[97] None of the terms in the introductory portion of Claim 1 is in dispute. The *relay device* of Claim 1 is simply a device that relays information. In Mr. Ault's language, it "facilitates the transmission of data elsewhere": Ault First Report, Appendix A, p 172. The '742 Patent itself defines *farming business* and *farming operation*, both with broad definitions:

> A farming business is any area of land or water (for aquaculture) that is devoted primarily to producing and managing food (i.e. produce, grains, or livestock), fibers, and increasingly fuel.
>
> […]
>
> A farming operation for a farming business is any farming job, task, chore, assignment or activity performed on or over land or water at the farming business, including without limitation, activities such as clearing land, tilling soil, mowing grass, irrigating or crop-dusting a field, feeding, herding or transporting animals, or fertilizing, planting, spraying or harvesting a crop.

The experts referred to and adopted these definitions: Edwards First Report, para 40; Ault First Report, Appendix A, p 172.

[98] Rather, the disputes between the parties lie in the five elements and multiple sub-elements of the claim, and in particular elements 1(d)(iii) [the *implement profile*] and 1(e)(i) [determining there is a *match*]. I will therefore focus attention on these elements, while briefly addressing the remaining terms used in Claim 1. There is also a dispute about whether it is an essential element of Claim 1 that certain aspects of the claim [notably elements 1(d)(ii), 1(e)(iii) and 1(e)(iv)] be located on the *relay device* itself. I will address this essentiality issue, and Farmers Edge's objection to Dr. Edwards' evidence on the issue, after reviewing the construction of the claim elements.

(a) *a microprocessor*

[99] A *microprocessor* is an integrated circuit that executes programming instructions provided by a computer program: Ault First Report, Appendix A, p 173; Edwards Second Report, para 44. As Dr. Edwards states, even the claims of the ’742 Patent that do not expressly refer to a microprocessor, such as Claim 38, must have one, since every modern computing system necessarily includes some form of microprocessor: Edwards First Report, para 48; Edwards Second Report, para 44.

(b) *a bus connector for connecting the relay device to a message bus on a farming vehicle or farming implement, wherein the message bus is configured to carry messages generated by the farming vehicle or the farming implement while the farming vehicle and the farming implement are used to perform the farming operation*

[100] The relay device of Claim 1 must have a *bus connector*, a physical connector allowing it to connect to the *message bus* on a piece of farming equipment, whether a *farming vehicle* or a *farming implement*. As described above, the POSITA would understand a *message bus* to be the internal network on a piece of farm equipment that allows transmission of messages from ECUs connected to it. The ISOBUS defined by the ISO 11783 standard is an example of a *message bus*: Ault First Report, Appendix A, p 173; Edwards Second Report, para 45.

[101] Farmers Edge argues the *message bus* of element 1(b) is necessarily limited to a message bus compliant with the ISO 11783 standard, that is to say, an ISOBUS. I cannot agree. The language of Claim 1 refers only to a *message bus* and not a particular type of message bus. Neither expert opined that the term *message bus*, in and of itself, only referred to an ISOBUS, or

would be understood by a POSITA to only refer to an ISOBUS. To the contrary, in first construing Claim 1, Mr. Ault described the *message bus* more broadly as the "shared network connecting multiple 'devices' onboard the machinery, over which the electronic messages are sent and received" and gave the ISOBUS only as an example: Ault First Report, Appendix A, p 173.

[102] The CGK of the POSITA included the knowledge that there were a number of "[m]essage buses allowing communications between devices on agricultural machines, including CAN, J1939, LBS [Landwirtschaftlichen BUS-System], and ISO11783 buses": Ault First Report, paras 294(a), 332. The LBS bus and the CAN bus/SAE J1939 buses are standardized buses that are forerunners of the ISOBUS: Ault First Report, paras 70, 95, 167, 188, Schedules 3T, 3U, 3W. Regardless of the similarities of the message buses in these standards, the POSITA's knowledge and understanding that different message buses exist undermines the suggestion that by referring to a *message bus*, the inventors meant the ISOBUS alone. The fact that most modern farming equipment, and "[a]lmost all" produced since 2005, contains a message bus that is ISO 11783 compliant does not mean that the term *message bus* as used in element 1(b) would be understood to be limited to such equipment or such buses: Ault First Report, para 71; Transcript, Day 3, p 20. On this point, and contrary to Farmers Edge's arguments, I cannot read Dr. Edwards' use of the phrase "the internal message bus (namely, the ISOBUS)" in his First Report to be a considered opinion that the *message bus* of Claim 1 (or Claim 20) is exclusively an ISOBUS, particularly when he used "e.g." in place of "namely" in his Second Report: Edwards First Report, para 77; Edwards Second Report, para 45.

[103] Farmers Edge also relies on the fact that the disclosure of the ’742 Patent does not refer to any message buses other than the ISOBUS, contains no definition of *message bus*, and specifically refers to the ISOBUS in its description of the message content extraction process (discussed further below). However, the disclosure uses both the general term *message bus* and the specific term ISOBUS, and the inventors chose to use *message bus* in the claims. The disclosure is important to understanding the terms of the claims. However, in my view, restricting the general term *message bus* in the claims to the ISOBUS alone, based on the references to the ISOBUS in the disclosure, would amount to inappropriately using the disclosure to limit the words of the claims as they would be understood by the POSITA: *Tearlab* at para 33, citing *Whirlpool* at para 52.

[104] With respect to the remainder of element 1(b), the ’742 Patent defines, in non-limiting language, the terms *farming vehicle* and *farming implement*. A *farming vehicle* may include tractors, trucks, or any other self-propelled vehicle or machine used to carry out *farming operations*. The patent gives, without limitation, 29 examples of *farming implement*, including cultivators, plows, seeders, planters, fertilizers, harvesters, wagons, and balers. In essence, a *farming implement* (*e.g.*, a plow) performs the farming task and is pushed or pulled along by a *farming vehicle* (*e.g.*, a tractor): Ault First Report, Appendix A, p 174.

[105] The *message bus* is configured to carry messages generated by the *farming vehicle* or *farming implement* while they are performing the *farming operation*. As this is essentially the function of a message bus, neither party argued this language adds materially to the meaning of element 1(b) beyond providing a functional description of the *message bus*.

(c) *a global positioning system receiver that receives position and time signals from space-based satellites while the farming operation is performed*

[106] The experts agree the skilled reader would understand the *global position system receiver* element to describe a standard GPS receiver that can localize its position geographically on the earth: Edwards Second Report, para 46; Ault First Report, Appendix A, p 174. Mr. Ault noted that while the GPS receiver is essential to the functionality of the claimed relay device, the skilled reader would understand it did not matter whether the GPS was hardwired to the relay device or simply connected to it: Ault First Report, Appendix A, p 174. Dr. Edwards did not disagree.

(d) *a memory storage area that stores (i) an electronic farm record for the farming business, (ii) descriptive information about a farming operation land segment associated with the farming business, and (iii) an implement profile defining, for a known farming implement, a known manufacturer code, a known device class, a known version and a known communication protocol*

[107] The fourth feature of the *relay device* of Claim 1 is a *memory storage area* that stores certain information. A *memory storage area* is any means of storing digital information, which could be main memory (RAM), a hard drive, or a flash drive: Ault First Report, Appendix A, p 175; Edwards Second Report, para 47. The *memory storage area* of Claim 1 must store three things: (i) an *electronic farm record*; (ii) information about a *farming operation land segment*; and (iii) an *implement profile*.

(i) electronic farm record [EFR]

[108] The ’742 Patent uses the term *electronic farm record*, found in Claim 1, interchangeably with *electronic farming record*, found in Claim 20. The experts agreed a skilled reader would adopt the description contained in the disclosure of the ’742 Patent, namely a record that includes “general information about the farming business, as well as detailed descriptions for each farming operation carried out at the farming business”: Ault First Report, Appendix A, p 175; Edwards First Report, para 64; Edwards Second Report, para 48. This information may include, for example, the date, time, location, and type of each *farming operation* and certain *operating events* that occurred during the performance of it. It can also include precision farming data transmitted over the message bus, such as the volume and type of fertilizer or seed, weather conditions, and operating states and parameters of the farming implement.

(ii) farming operation land segment [FOLS]

[109] The *farming operation land segment*, which the disclosure of the ’742 Patent shortens to “FOLS,” is a term unique to the patent. It is defined in the disclosure as “a contiguous or non-contiguous parcel of land on the earth where a farming operation takes place, and as such, may comprise a farm, field, lot or pasture, or a combination of two or more farms, fields, lots or pastures.” It is essentially the area(s) where a *farming operation* takes place: Edwards First Report, para 67; Edwards Second Report, para 49; Ault First Report, para 16 and Appendix A, pp 175–176. As the disclosure states, the FOLS may correspond with a government designation for a farm or a designation for a field or a lot, such as a CLU, or it may not. It may also include land that is not actually treated by a *farming implement* during a *farming operation*:

Ault First Report, Appendix A, pp 175–176. This distinguishes it from the concept of a *travel path*, discussed below, which is the area where a particular *farming operation* is actually performed.

(iii) implement profile

[110] The *implement profile* stored in the *memory storage area* contains information about a *known farming implement*, that is, a farming implement about which the relevant information is already known. The *implement profile* of Claim 1 may contain a variety of information about the *known farming implement*, but it must define at least a *known manufacturer code*, a *known device class*, a *known version*, and a *known communication protocol*.

known manufacturer code and known device class

[111] The terms *known manufacturer code* and *known device class* represent a significant point of contention between the parties. In closing submissions, counsel for Farmobile described this as "the big issue" that is "going to determine everything" although, as set out below, numerous other issues were still addressed: Transcript, Day 12, pp 9–11.

[112] There is no dispute over the term *known*, which is used in connection with the term *farming implement* as well as the terms *manufacturer code*, *device class*, *version*, and *communication protocol*. To paraphrase Farmobile's language, *known* simply means known by the system or device described in the claim: Farmobile Closing Submissions, para 33; Farmers Edge Closing Submissions, para 17. A *known manufacturer code* for a *known farming implement* is thus simply a *manufacturer code* that the system knows to be associated with a

particular implement. Rather the dispute is over the meaning of the terms *manufacturer code* and *device class*. Unlike other terms used in the ’742 Patent, the inventors have provided no definition of the terms *manufacturer code* and *device class* in the disclosure of the patent to assist the skilled reader. The task is therefore to determine how the POSITA would understand the terms without such assistance.

[113] Farmers Edge’s position is that the terms *manufacturer code* and *device class* are terms of art defined in the ISO 11783 standard as part of the NAME field and that the POSITA would understand them as such. Farmobile’s position is that the POSITA would understand them as general terms covering any code that identifies a manufacturer and a device, not limited to the NAME field codes set out in the ISO 11783 standard.

[114] The principle that terms in a patent are construed through the eyes of the skilled reader in light of their CGK at the date of publication takes on particular importance with respect to these terms. To the lay reader considering the terms outside the context of the patent and its field of art, the term *manufacturer code* could well be understood to mean any sort of code assigned by anyone to identify a manufacturer. The term *device class* could similarly mean simply a description of the type or class of a device. However, this is not the relevant perspective. With the assistance of the expert evidence, the Court must put itself in the position of the skilled reader and construe the patent through their eyes: *Whirlpool* at paras 53, 57. I therefore begin with a review of the expert evidence on the issue. I will then turn to the parties’ arguments with respect to the other language of Claim 1; dependent Claims 2 and 21; and the disclosure of the

’742 Patent. Given the importance of the construction of these terms, I will address the parties’ evidence and arguments on them in some detail.

[115] By way of summary, I conclude the skilled reader, reviewing Claim 1 in light of the CGK and in the context of the patent at the date of publication, would understand the terms *manufacturer code* and *device class* to have the meaning they are known to have in the field of network communication on agricultural equipment, *i.e.*, the meaning set out in the ISO 11783 standard of codes appearing in the NAME field of messages sent by ECUs, such as those on farming equipment, and assigned to identify manufacturers and device types respectively.

Mr. Ault’s evidence

[116] Mr. Ault’s opinion is that in the context of the ’742 Patent, which deals with the transmission of data from agricultural equipment over a message bus and uses terms well known in the industry, the POSITA would understand *manufacturer code* and *device class* in Claim 1 to mean what they mean in the ISO 11783 and SAE J1939 standards, namely values assigned under the standard and found in the NAME field. This opinion was first expressed in Mr. Ault’s First Report, and was reiterated in his later reports and in his trial testimony: Ault First Report, Appendix A, pp 176–177; Ault Second Report, paras 5, 34–36; Ault Third Report, paras 113–115, 124; Ault Fifth Report, paras 16, 22–23, 25–27; Ault Sixth Report, paras 60–62; Transcript, Day 8, pp 61–62, 103–104; Transcript, Day 9, pp 38–48.

[117] On this interpretation, the *manufacturer code* represents a manufacturer code found in Annex G to ISO 11783-1 (*e.g.*, the value 7 for “Case Corp.” or 12 for “Deere & Company,

Precision Farming"), while the *device class* represents a device class code found in Annex E to ISO 11783-1 (*e.g.*, the value 5 for "Fertilizers" or 6 for "Sprayers"). In Mr. Ault's view, the '742 Patent does not give any indication that these terms should be understood differently from their traditional known meaning in the communications standards: Ault Second Report, para 36.

[118] In cross-examination, Mr. Ault was taken to passages in the disclosure that Farmobile contends support its construction of *manufacturer code*, *device class*, and the process of determining a *match*, including Figure 7: Transcript, Day 9, pp 34–41, 44–48. In his responses to these questions, Mr. Ault stated that while he considered the disclosure, including the diagrams, he considered his role to be to construe the claims and to turn to the disclosure only where the skilled person would have felt the claims were unclear given their knowledge: Transcript, Day 9, pp 39, 46–47. I consider below at paragraphs [148] to [159] and [189] to [190] the merits of Farmobile's arguments based on these aspects of the disclosure. However, I will address at this point Farmobile's argument that Mr. Ault's responses show he took the wrong approach to construction altogether.

[119] As noted above, the language of a patent's claims are to be read and understood in the context of the patent as a whole including its disclosure and other claims: *Biogen* at paras 71–73; *Tearlab* at para 33; *Whirlpool* at paras 49(e)–(f), 52; *Viiv* at paras 57–58. The parties each cited *Biogen* and agreed the disclosure should inform the Court's construction of the claims. At the same time, there has been some question in Canadian law as to whether "recourse" should be had to the disclosure only where the claims are themselves ambiguous: *Tearlab* at para 33; *Viiv* at

paras 59–60; *AstraZeneca* at para 31; see also the discussion in *Guest Tek Interactive Entertainment Ltd v Nomadix, Inc*, 2021 FC 276 at paras 41–48.

[120] In *Biogen*, the Federal Court of Appeal found it "important to reiterate that a patent's description (also referred to as the disclosure) must be considered when construing claims" [emphasis added]: *Biogen* at para 71. Justice Gauthier for the Court of Appeal went on to note that "the whole disclosure must be reviewed, even for words that would appear at first glance to be simple and unambiguous when reading only the claims" [emphasis added]: *Biogen* at para 73, citing *Whirlpool* at paras 49(f), 52, 54. The Court of Appeal has thus stated clearly and recently that the disclosure should guide patent construction in all cases. Based on *Biogen*, Farmobile argues Mr. Ault's approach of only referring to the disclosure when the claims were unclear was an error of law and that his opinion should be discounted as a result.

[121] I disagree. I note that not long after *Biogen*, a different panel of the Federal Court of Appeal issued its decision in *Betser-Zilevitch v Petrochina Canada Ltd*, 2022 FCA 162. In that case, the Court of Appeal found this Court had not erred in construing a claim term with reference to the disclosure, holding the Court had "correctly concluded that the term is ambiguous, and appropriately had recourse to the disclosure of the [patent] to construe it" [emphasis added]: *Betser-Zilevitch* at para 5, citing *Dableh v Ontario Hydro*, 1996 CanLII 4068, [1996] 3 FC 751 (CA) at para 30 and *Tetra Tech* at para 103. If this passage in *Betser-Zilevitch* is read to mean that recourse to the disclosure is *only* permissible where a claim term is found to be ambiguous, it might be read as inconsistent with *Biogen*, such that the question may remain

open. If it is read more narrowly, as simply a finding that this Court did not err in referring to the disclosure in that particular case, there is no inconsistency. I am inclined to the latter reading.

[122] An expert might be excused for not remaining abreast of the finer points of Canadian patent law. However, it is important for the Court to assess whether their opinion is based on a fundamentally incorrect premise on how to construe a patent. In my view, Mr. Ault's opinion was not based on such a premise. It is clear from his reports and testimony that Mr. Ault reviewed the disclosure of the patent and sought to read the claims in light of the entire patent and through the eyes of the POSITA, while focusing on the language of the claims. This is what he was instructed to do, and in my view his opinions were consistent with such an approach: Ault First Report, para 12A, fn 4. Indeed, Mr. Ault expressly considered whether the patent as a whole indicated that a different construction should be put on the terms *manufacturer code* and *device class*: Ault Second Report, para 36. This included brief reference to the discussion of Figure 7, which Mr. Ault gives as an example of how the terms *manufacturer code* and *device class* are used to refer to portions of the NAME field of an address claim message: Ault First Report, Appendix A, p 177.

[123] In this context, I do not take Mr. Ault's statements that he only referred to the body of the patent where the claim was "unclear" to mean that he did not consider the whole of the patent in construing the claims. Nor do I take these answers, considered together with Mr. Ault's reports, as indicating he adopted an incorrect approach to claims construction that should lead me to reject his evidence as a whole.

[124] In any event, and as discussed further below, I do not consider Farmobile's various references to the disclosure, including Figure 7, to be helpful in construing the terms *manufacturer code* and *device class* as they appear in the claims. I note, too, that to the extent Mr. Ault erred in not referring to these passages in the disclosure, Dr. Edwards' evidence suffered from the same error, as he did not refer in his reports or his trial testimony to either Figure 7 or other parts of the disclosure Farmobile took Mr. Ault to, such as the question of serialization of the *relay device*.

[125] On the whole, I found Mr. Ault's evidence on the understanding a skilled reader would have of the terms *manufacturer code* and *device class* to be internally consistent and understandable, unshaken by cross-examination, consistent with the discussion and evidence regarding the CGK, and not contradicted by anything in the '742 Patent.

Dr. Edwards' evidence

[126] As Farmers Edge points out, Dr. Edwards did not provide a positive construction of the terms *manufacturer code* and *device class* in his reports, in the sense of setting out how a skilled reader would understand the terms. In his First Report, Dr. Edwards addressed construction and infringement of the Assert Device Claims. In giving his opinion on how a skilled reader would understand the elements of Claim 20, he stated they would know the *known manufacturer code* and *known device class* are required aspects of the *implement profile*. However, he did not address how the skilled reader would understand the terms themselves: Edwards First Report, paras 52, 71–72; Transcript, Day 3, pp 21–22.

[127] In assessing infringement in his First Report, Dr. Edwards concluded Farmers Edge's FarmCommand system stored an implement profile that contained "the manufacturer of the implement" and "the type (device class) of the implement": Edwards First Report, paras 187–189, 312 (p 157). He did so without discussing how a skilled reader would understand the terms *manufacturer code* and *device class*, or why he concluded the data in the FarmCommand system fell within the scope of those terms. Mr. Ault noted this lacuna: Ault Second Report, at para 34. Nonetheless, Mr. Ault responded to Dr. Edwards' apparent implicit construction that the terms could include text strings, and were therefore not limited to the codes in the ISO 11783 standard: Ault Second Report, paras 5, 37–41; Transcript, Day 9, pp 41–42; see also Ault Fifth Report, paras 16, 25–27; Ault Sixth Report, paras 60–62.

[128] Dr. Edwards' Second Report responded to Mr. Ault's First Report and addressed construction of the remaining claims and issues of validity. Dr. Edwards agreed with Mr. Ault's assertion that the NAME field defined in ISO 11783, containing a manufacturer code and device class, was part of the CGK and recognized that a skilled person would know those terms: Edwards Second Report, paras 23, 151. However, he did not respond to or contradict Mr. Ault's opinion that a skilled reader would understand the terms *manufacturer code* and *device class* in Claim 1 in accordance with their meaning in ISO 11783. This lack of response is notable, since Dr. Edwards directly addressed the construction of Claim 1, and directly disagreed with other aspects of Mr. Ault's construction of the same sub-element in Claim 20 in addressing validity: Edwards Second Report, paras 52, 583–584, 592–612. Nonetheless, in addressing Claim 2, which I will turn to shortly, Dr. Edwards noted that in the context of that claim, the *manufacturer code* in the implement profile must be one sent in an address claim message "and not some other

type or format of manufacturer code": Edwards Second Report, para 78; see also para 125, in respect of Claim 21.

[129] Dr. Edwards' Third, Fourth, and Fifth Reports do not address the construction of these terms. It was not until his Sixth Report in February 2022, addressing the July 2021 and February 2022 Updates, that Dr. Edwards expressly asserted that the *manufacturer code* and *device class* of Claim 1 need not be in the format of the NAME field defined by ISO 11783, although he again did not provide a positive construction of what the terms would be understood to mean, or why the skilled reader would understand them in that way: Edwards Sixth Report, paras 28, 34.

[130] In his evidence in chief at trial, Dr. Edwards repeated his view that the *known manufacturer code* and *known device class* had to be included within the *implement profile*, along with the *known version* and *known communication protocol*: Transcript, Day 3, pp 13, 21–22, 35; Exhibit 31, pp 23, 36–37, 62. In addressing infringement and validity, Dr. Edwards also stated his view that the *manufacturer code* and *device class* were not limited to those specified in the ISO 11783 standard as part of the NAME field or an address claim message: Transcript, Day 3 (CEO), p 31; Transcript, Day 4, pp 10–11, 13–14.

[131] In cross-examination, Dr. Edwards stated that he did not address the construction of the terms *manufacturer code* and *device class* in his First Report because he was expecting the POSITA to give them their "normal computer science meaning" or their "standard and ordinary meaning": Transcript, Day 4, pp 51–55. In particular, he testified that the term "manufacturer

code" is a general term used in the field of embedded systems and software engineering referring to a code for a manufacturer: Transcript, Day 4, pp 62–65.

[132] As noted above at paragraph [73], Dr. Edwards was unwilling to concede in cross-examination that the CGK of the skilled reader included knowledge of the terms "manufacturer code" and "device class" as defined in the ISO 11783 standard, despite his agreement to that effect in his Second Report: Transcript, Day 4, pp 57–60, 62; Edwards Second Report, paras 23, 76, 151. Rather, he suggested there may be other standards relevant to the field or the '742 Patent. However, he did not identify any other such standards beyond (i) the SAE J1939 standard, which appears to use the terms in the same way as the ISO 11783 standard, and (ii) the RS-232 standard, about which the Court has little evidence beyond its relevance to connecting analog farm implements: Transcript, Day 3, p 44; Transcript, Day 4, pp 63–64; Ault First Report, para 177. Nor did Dr. Edwards indicate how any such other standards might affect the POSITA's understanding of the terms.

[133] I agree with Farmers Edge that these aspects of Dr. Edwards' evidence, including the limited discussion in his reports and his inconsistent evidence on the issue of the ISO 11783 standard, undermine his opinion on the meaning of the terms *manufacturer code* and *device class*. Importantly, Dr. Edwards' assertion that the term "manufacturer code" is a general term used in the fields of embedded systems and software engineering to refer to a code for a manufacturer, and that the skilled reader would understand *manufacturer code* and *device class* as used in the claims in accordance with their "normal computer science meaning," was unsupported by any evidence or examples to show whether or how those terms are in fact used in

those fields: Transcript, Day 4, pp 53, 64–65. Nor did he provide an explanation for why the terms would not be understood the way they are used in the particular field of computer devices on agricultural equipment, except to state that the terms were used more broadly in other fields.

[134] I therefore consider Mr. Ault's evidence more consistent, supported, and persuasive than that of Dr. Edwards on this issue.

Other language of Claim 1

[135] As I have concluded above at paragraph [103], element 1(b) refers only to a *message bus*, meaning a message bus generally, and not an ISOBUS in particular. Farmobile argues this means the *manufacturer code* and *device class* should not be read as limited to those terms as used in the ISO 11783 standard in particular. I am not persuaded. The fact that the inventors have used in a claim a term whose meaning in the eyes of a POSITA would be broader (*message bus*) does not mean that other terms in the claim (*manufacturer code*, *device class*) would be read by the POSITA to be broader than their meaning as ordinarily understood in the art. Further, there is no evidence that the terms *manufacturer code* or *device class* are used in the context of other message buses in a different way than they are in respect of the ISOBUS. Indeed, with respect to the CAN bus, the evidence is that the SAE J1939 standard, on which the ISO 11783 standard was based, uses the terms in the same way: Ault First Report, paras 70, 95, 177; Ault Second Report, Schedule 2, Document A, p 392/513; Edwards Second Report, para 394, Exhibit PP, pp 6–12.

Dependent Claims 2 and 21

[136] Both parties assert that the language of Claim 2 (reproduced at paragraph [260] below) and Claim 21 (reproduced at paragraph [284] below) supports their respective constructions of the terms *manufacturer code* and *device class* in Claims 1 and 20. The same arguments also apply to Claim 40 vis-à-vis independent Claim 38, but the parties focused their arguments on Claims 2 and 21.

[137] Claim 2 adds limitations on the *match* provided in element 1(e)(i), namely the "match between the farming implement used to perform the farming operation and the known farming implement of the implement profile." Claim 21 adds similar limitations to the *match* of Claim 20. I will therefore refer to Claim 2 as exemplary.

[138] As described in further detail below, Claim 2 requires the *match* to be performed through a four-step process: (a) detecting an *address claim message* sent by the *farming implement*, containing a *manufacturer code* and a *device class* for the implement; (b) detecting an *object pool version message* sent by the *farming implement*, containing a *version* for the implement; (c) confirming a *first match* between the *manufacturer code* and *device class* in the *address claim message* and the *known manufacturer code* and *known device class* in the *implement profile*; and (d) confirming a *second match* between the *version* in the *object pool version message* and the *known version* in the *implement profile*. Claim 2 thus describes a particular process for matching message content to information in the *implement profile* that specifies (i) the source of the content being matched (an *address claim message* sent by the *farming*

implement); (ii) the nature of the content being matched (*manufacturer code*, *device class* and *version*); and (iii) the manner of matching (with two matches being confirmed).

[139] The experts and parties agree the *address claim message* and the *object pool version message* of Claim 2 would be understood as those terms are used in the ISO 11783 standard. As a result, the *manufacturer code* and the *device class* from the *address claim message* sent by the *farming implement* would be understood as being those defined as part of the NAME field in the ISO 11783 standard: Edwards Second Report, paras 76, 78; Transcript, Day 4, pp 13–14, 66–68; Ault First Report, Appendix A, pp 176–178, 183–184.

[140] Farmobile relies on the principle of claims differentiation, discussed at paragraph [83] above. It argues the limitations on the nature of the *manufacturer code* and *device class* in Claim 2 should not be read into Claim 1, and that Claim 1 should therefore not be read as limited to the meaning set out in ISO 11783: Edwards Sixth Report, paras 19–20, 34.

[141] Farmers Edge relies on the principle of claim consistency, discussed at paragraph [84] above. It argues that since the terms *manufacturer code* and *device class* in Claim 2 are agreed by all to have the meaning in ISO 11783, the same terms used in Claim 1 would be understood to have the same meaning.

[142] While each of these arguments has some superficial attraction, I conclude that neither presumption is persuasive in determining the meaning of *manufacturer code* and *device class* in Claim 1.

[143] With respect to claims differentiation, Claim 2 does not add a limitation to the *manufacturer code* and *device class* stored in the *implement profile* of element 1(d)(iii). It does not claim, for example, "The relay device of Claim 1, wherein the manufacturer code and device class defined in the implement profile are of a type found in an address claim message." Rather, Claim 2 adds a limitation to the step of determining a *match* in element 1(e)(i), providing a particular manner for the program to determine the match: Edwards Second Report, para 74; Transcript, Day 4, p 76.

[144] In my view, the fact that the *match* is performed in a particular way in Claim 2 does not mean the *manufacturer code* and *device class* contained in the *implement profile* of Claim 1 must have a broader meaning allowing for values other than those in an *address claim message*. Reading *manufacturer code* and *device class* in Claim 1 in accordance with their meaning in the ISO 11783 standard would not involve reading the limitations of Claim 2 relating to the *match* into Claim 1. In addition, as Farmers Edge points out, the limitation on the match in Claim 2 requires the *version* in the *object pool version message* to match with the *version* in the *implement profile*, discussed below: Transcript, Day 4, p 68. I thus agree with Farmers Edge that Claim 2 is not redundant over Claim 1, regardless of the construction of the terms *manufacturer code* and *device class* in Claim 1.

[145] To the extent that Claim 2 can be read as giving additional definitional language in respect of the *manufacturer code* and *device class*, which I believe it does not, the POSITA would recognize that other claims of the '742 Patent add redundant additional language to terms used in Claim 1. Notably, Claims 4 and 19 each provide as an additional limitation on the claim a

definition of the *travel path* that is precisely how the parties and experts agree the *travel path* of Claim 1 would already be understood. Claim 20 includes the same language, while Claim 1 does not. The POSITA reading the claims as a whole would therefore be less inclined to consider that the additional language of Claim 2 required a different reading of Claim 1.

[146] With respect to the presumption of claim consistency, the fact that Claim 2 refers to a *manufacturer code* and *device class* from an *address claim message* being used in the *match* does not itself mean the *manufacturer code* and *device class* in the *implement profile* of Claim 1 must be limited to the type in an *address claim message*. Evidently, for there to be a match, the *manufacturer code* and *device class* in the *address claim message* sent by the *farming implement* of Claim 2 must be the same codes as the *manufacturer code* and *device class* in the *implement profile*. This means that for the match to occur in the way claimed in Claim 2, the specific *manufacturer code* and *device class* stored in the *implement profile* must be in the ISO 11873 format. However, this does not itself limit the nature of the codes that might be present in the *implement profile* of Claim 1 and does not itself mean the terms *manufacturer code* and *device class* must be interpreted as limited to codes in the ISO 11873 format.

[147] In sum, I conclude that the nature of the limitation and language of Claim 2 (and Claims 21 and 40) does not create presumptions affecting the construction of Claim 1, and does not assist in construing *manufacturer code* and *device class* in Claim 1, either as contended by Farmobile or as contended by Farmers Edge.

Disclosure of the ’742 Patent

[148] As noted above, the disclosure of the ’742 Patent does not define the terms *manufacturer code* and *device class*. However, the parties made arguments with respect to two aspects of the disclosure: (i) the use of the two terms in the body of the disclosure; and (ii) the contents of Figure 7.

[149] Farmobile argues the terms are used in the body of the disclosure in a broader sense than their meaning in ISO 11783. Farmers Edge, conversely, argues the terms are used in accordance with the ISO 11783 definition throughout the ’742 Patent.

[150] In my view, the body of the patent generally provides little clarification of the terms. However, the repeated use of the two terms concurrently gives some support to Farmers Edge’s position. When used in the disclosure, the terms *manufacturer code* and *device class* generally appear together, being listed as part of the implement profile or being used in the matching process. There is little express explanation or context in these references to suggest the terms are being used either more broadly than their ISO 11783 sense (as Farmobile contends), or as necessarily limited to their ISO 11783 sense (as Farmers Edge contends). At the same time, the repeated connected use of two terms that are terms of art connected in the ISO 11783 standard as part of the NAME field would suggest to the skilled reader that the terms are being used in the sense of that standard. I note that while Dr. Edwards stated that each term had a “normal computer science meaning,” he provided no other examples where the terms were used together or with a related function, as they are in the ISO 11783 standard: Transcript, Day 4, p 53.

[151] The term *device class* also appears in Figure 11 and in the disclosure's description of that figure, which is a flow diagram illustrating the "ECU detection process" in an exemplary embodiment. The term *device class* is used without the term *manufacturer code* in this context, although it is clearly being used to mean the "DEVICE CLASS field of the NAME portion" of an address claim message. No party or expert suggested the skilled reader would rely on this reference in Figure 11 or understand anything from it.

[152] I therefore do not accept Farmobile's argument that the references in the disclosure indicate that the terms have a broader meaning than in the ISO 11783 standard. Nor do I accept Farmers Edge's argument that the references clearly confirm that the terms are only limited to their ISO 11783 meaning. However, they do provide some interpretive support for Farmers Edge's position. This is particularly so since the '742 Patent, both in its claims and its disclosure, is rife with terminology derived from or common to the ISO 11783 standard, including such terms as electronic control unit, object pool, virtual terminal, virtual terminal object ID, and the NAME field itself. This general context would confirm to the POSITA that they were reading a document that conveyed and was familiar with the ISO 11783 lexicon, supporting the conclusion that the terms *manufacturer code* and *device class* are similarly drawn from that lexicon.

[153] I also do not accept Farmobile's argument that its construction is supported by the fact that the '742 Patent does not refer to the ISO 11783 standard until page 9 of the disclosure. Nothing prior to this point gives any substantive discussion of the meaning of the terms *manufacturer code* and *device class*; most of the first 9 pages deals with matters such as general

background, CLUs, and definitions of other terms such as *farming business*, FOLS, and *travel path*. Given that the ISO 11783 standard would be part of the CGK of the skilled reader, the fact that it appears for the first time on page 9 would not affect the skilled reader's recognition and understanding of the terms.

[154] Farmobile also relies on Figure 7 of the '742 Patent, both to support its construction and, as discussed above, to criticize Mr. Ault's testimony. Figure 7 is described in the patent as showing an example of "an implement (or ECU) profile 705 in XML [extensible markup language] format." The figure shows a series of lines in XML format, beginning with the following lines:

```
<Sprayer>
<NAME Industry="Agriculture" Device="Sprayers" Function="128" Manufacture="Deere"
Identity="3">
```

[155] Farmobile argues that the references to "Sprayers" and "Deere" show a *device class* and a *manufacturer code* being represented as a text string. It argues this is something other than one of the numeric codes set out in the ISO 11783 standard, and that it therefore supports its construction that the terms can mean codes beyond those in ISO 11783. It also argues Claim 1 should not be construed in a way that would exclude the embodiment of an *implement profile* shown in the drawings.

[156] I disagree that Figure 7 supports Farmobile's argument, for two reasons. First, and most significantly, neither of the experts suggested the skilled reader would draw from Figure 7 the conclusions Farmobile asks the Court to draw. Dr. Edwards did not refer to it in either his reports or his testimony. As noted above, Mr. Ault briefly referred to the discussion of the figure as an

example of use of the terms *manufacturer code* and *device class* as part of the NAME field in an address claim message: Ault First Report, Appendix A, p 177. The first time Farmobile raised the figure was in a brief exchange during its cross-examination of Mr. Ault, who simply agreed that in the figure, "that manufacturer key and that XML tag has the value of Deere": Transcript, Day 9, pp 47–48.

[157] Without evidence from either expert that a POSITA would understand the reference in Figure 7 to show that the *manufacturer code* could be something other than the manufacturer code as found in the NAME field, I am unwilling to place material reliance on it. This is particularly so since Figure 7 is said to be an implement profile "in XML format." The Court heard little evidence about XML, likely because Figure 7 was not substantively addressed until cross-examination of Mr. Ault. Without such evidence, the Court is unable to reach any conclusions about whether what is shown in Figure 7 represents, as Farmobile claims, a *manufacturer code* or *device class* of a different type or, as Farmers Edge claims, simply parsed information containing XML tags for "Manufacturer" and "Device" and not a *manufacturer code* and a *device class*.

[158] Second, Figure 7 cannot be viewed in isolation. It must be viewed and considered in the context of the discussion of the figure in the body of the patent, as Mr. Ault's passing reference suggests. In Figure 7, an arrow numbered 705 points to the implement profile in XML format as a whole; another arrow numbered 710 points to the word "NAME" that appears in the excerpt shown above. These aspects of the figure are discussed in the disclosure in the following terms:

> FIG. 7 shows an example of an implement (or ECU) profile 705 in XML format. As indicated by the values in the NAME field 710,

> this particular implement profile is for a "sprayer" manufactured by the "Deere™" company. As shown in FIG. 7, the profile includes a host of important current operating parameters, as well as the VT object numbers used by the sprayer to signal those parameters. […]
>
> [Emphasis added.]

[159] As set out in this passage, the values in the first line of the implement profile of Figure 7—which begins with the capitalized word NAME—are said to be "values in the NAME field." As discussed above, the NAME field is a field defined in the ISO 11783 standard that includes the manufacturer code and device class. Dr. Edwards agreed with Mr. Ault that it was part of the skilled reader's CGK that the NAME field is a field found in an address claim message specified by the ISO 11783 standard and containing a manufacturer code and device class: Edwards Second Report, paras 23, 76, 123; Ault First Report, para 121 and Appendix A, pp 176–177. Neither Dr. Edwards nor Farmobile proposed any meaning for "NAME field" other than that defined in the ISO 11783 standard. The '742 Patent itself refers to the "ISO 11783 NAME field." As indicated, I am reluctant to draw conclusions regarding Figure 7 in the absence of expert evidence on the issue. However, at the very least, the patent's statement that Figure 7 shows "values in the NAME field" does not support Farmobile's claim that the figure shows an example of *manufacturer code* and *device class* values <u>different</u> from those in the NAME field.

Conclusion

[160] For these reasons, I find the parties' various arguments regarding the other language of Claim 1; the limitations of dependent Claim 2 and presumptions regarding construction; and the disclosure of the '742 Patent including the diagrams provide only modest additional assistance in

assessing how the skilled reader would understand the terms *manufacturer code* and *device class*, and thus *known manufacturer code* and *known device class*, as they appear in Claim 1. The Court is therefore left primarily with the opinions of the experts as to the POSITA, the CGK of the POSITA, and how the POSITA would understand those terms used in the context of the ’742 Patent.

[161] Having considered this evidence and Claim 1 in the context of the patent as a whole and the CGK, I prefer Mr. Ault’s evidence and Farmers Edge’s proposed construction. Mr. Ault’s construction is consistent with the use of the terms “manufacturer code” and “device class” appearing in, and defined by, the ISO 11783 standard, which was part of the CGK of the POSITA at the relevant date and which is directly applicable to the field of the invention. The terms *manufacturer code* and *device class* appear in Claim 1 together and, as noted above, generally appear together elsewhere in the claims and disclosure of the ’742 Patent, an association that would underscore in the mind of the POSITA their relationship as seen as part of the NAME field defined in the ISO 11783 standard. They also appear in the context of the frequent use of numerous terms found in the ISO 11783 lexicon.

[162] Conversely, Dr. Edwards’ construction appears to have been based primarily on his statement that the terms are general terms used more broadly in the fields of embedded systems and software engineering. As noted above, this statement was unsupported by any evidence or examples to show such use. It also unduly focuses on the meaning of the terms in fields broader than the particular field of the patent. Beyond this statement, Dr. Edwards’ did not explain why the terms would not be understood in accordance with their use in the ISO 11783 standard, and

Dr. Edwards' efforts to downplay the importance of the standard led him to make inconsistent statements about the role of the ISO 11783 standard in the CGK of the POSITA, which undermined the persuasiveness and reliability of his evidence on this point.

[163] I therefore conclude that the POSITA, reviewing Claim 1 in light of the CGK and in the context of the patent at the date of publication, would understand the terms *manufacturer code* and *device class* to have their known meaning in the field of network communication on agricultural equipment, *i.e.*, the meaning set out in the ISO 11783 standard of codes appearing in the NAME field of messages sent by ECUs, such as those on farming equipment, and assigned to identify manufacturers and device types respectively.

known version

[164] In addition to the *known manufacturer code* and the *known device class*, the *implement profile* must also store a *known version*. Again, this term is not defined by the inventors in the disclosure.

[165] As with his construction of *manufacturer code* and *device class*, Dr. Edwards adopted a general construction of the term *version*, stating it would simply be understood to mean "one of several possible variants of something," such as a software or hardware version: Transcript, Day 3, p 24; Edwards Second Report, paras 604–612, 674–682.

[166] Mr. Ault opined that unlike the terms *manufacturer code* and *device class*, the term *version* was not a term of art that would be readily known to the POSITA. He concluded the

POSITA, familiar with the CGK including the ISO 11783 standard, would understand the term to encompass at least (i) the virtual terminal object pool version described in the ISO 11783 standard and discussed at paragraph [71] above; (ii) the relevant version of the ISO 11783 standard defining the task controller, which is needed to understand task controller messages (referred to in Claims 7 and 8); and (iii) the identity number or unique identifier contained in the NAME field of the address claim message: Ault First Report, Appendix A, pp 177–178. Dr. Edwards agreed these types of versions would fall within the meaning of the word *version* in Claim 1, but contended the *version* could also include other types and forms of version information: Edwards Second Report, paras 604–612. The difference in the experts' views on this issue does not affect a determinative issue.

known communication protocol

[167] There is no dispute between the parties as to the meaning of the term *communication protocol* itself. Dr. Edwards describes it as a "set of rules that govern how an interaction or communication will take place between two computing components," noting that a communication protocol "describes the meaning, format, and encoding of ECU messages that the implement uses to communicate farming operation data": Transcript, Day 3, p 2; Edwards First Report, para 73. Mr. Ault suggested the metaphor of the *communication protocol* being a dictionary: Ault First Report, Appendix A, p 178.

[168] Both experts referred to the following passages from the disclosure, in which the inventors state that because of the *known communication protocol*, and the *match* discussed below, the system "knows" the language the farming implement is speaking:

> Because of this match, the system now 'knows' which farming implement is being used, and because of the known communication protocol for the known farming implement, the system now "knows" the "language" that the farming implement uses to communicate with the farming vehicle over the message bus.
>
> […]
>
> Among other things, each implement profile identifies a communication protocol for a known implement. Thus, when an application program determines that the implement in use matches an implement profile stored in the memory, the application program then "knows" the communication protocol that the current implement uses to communicate with the farming vehicle. The known communication profile [*sic*] provides a key that permits the application program to parse subsequent messages transmitted over the message bus in order to identify the operating parameters for the current farming operation.

[169] Knowing the *communication protocol* of a particular implement thus allows the application to parse (*i.e.*, read and understand) messages transmitted over the message bus. The parties agree that a *communication protocol* can be either a proprietary protocol defined by a manufacturer or a standard protocol such as that set out in the ISO 11783 standard.

> (e) *an application program comprising programming instructions that, when executed by the microprocessor, will cause the microprocessor to automatically*

[170] The computer program of the relay device has to have instructions that cause the microprocessor to *automatically* perform four steps. Farmers Edge asserts a POSITA would understand the word *automatically* to mean the four steps must be performed in sequence, that is, that "the completion of one step in the process triggers the next step in the process to begin": Ault Second Report, paras 11, 79–81, 147–148. Farmobile contends that *automatically* simply

means “the software will run when executed and perform the steps”: Edwards First Report, para 198.

[171] The difference between the parties is essentially whether there is a requirement for automatic flow for all four steps. On Farmers Edge’s construction, once the computer program is set in motion, it must perform all four steps, without intervening human intervention or a “break in execution flow”: Ault Second Report, paras 147–148; Transcript, Day 8, pp 109–110. On Farmobile’s construction, the program need only cause the four steps to automatically occur, as opposed to the user having to do them manually, even if some human intervention is required: Edwards Third Report, para 38; Transcript, Day 3, pp 23–24. In other words, the question is whether the program must *automatically* perform steps (i) through (iv) in a row without a break, or whether it only needs to *automatically* perform each of the four steps.

[172] In my view, a purposive approach to the claims supports Farmobile’s construction. As a POSITA would understand, the purpose of the computer program described in the claim is to have a computer, rather than a user, perform each of the steps. It is not to ensure that there is no break between them or that a user need not, to use Farmobile’s example, click a button to continue processing.

[173] Indeed, Farmers Edge itself argues that requiring user input to proceed does not change the “automatic” nature of the program when discussing the prior art, asserting that the fact that a user is asked for a confirmation of an automatically-detected field [step (iii)] “does not alter the fact that it was still automatically identified in the first place”: Farmers Edge Closing

Submissions, para 29; Ault Third Report, paras 38–39. In my view, a POSITA would understand that the purpose of these elements is to have the computer perform automatic data extraction and processing. They would not conclude that the patented claim could be avoided, for example, simply by introducing a confirmation step or separating the timing of the steps.

[174] I therefore conclude that a POSITA would understand Claim 1(e) to mean the *relay device* comprises an *application program* that performs each of steps (i), (ii), (iii), and (iv) *automatically*, but does not necessarily perform all of them sequentially using the completion of the prior step as an automatic trigger to commence the next step without user intervention.

> (i) extract content from one or more messages transmitted on the message bus and use the extracted content to determine that there is a match between the farming implement used to perform the farming operation and the known farming implement of the implement profile

[175] The computer program must *extract content* from one or more *messages transmitted on the message bus*, and use that content to determine there is a *match* between the *farming implement* performing the *farming operation* and the *known farming implement* whose information is in the *implement profile*. This element is the subject of further disagreement between the parties, particularly with respect to the source and nature of the *content* extracted and the information used for the *match*.

[176] With respect to source, Farmers Edge and Mr. Ault contend the *content* in question is information sent by the *farming implement* via the *message bus*, which information is then used to perform the *match*: Ault First Report, para 85 and Appendix A, p 179. Farmobile and

Dr. Edwards argue the *content* need only be information sent via the *message bus* and received by the device, rather than necessarily being sent by the *farming implement*: Edwards Second Report, para 57.

[177] In my view, Farmobile's construction more accurately reflects the language of Claim 1. As set out above, a POSITA would know that the message bus is designed to carry messages from various ECUs connected to the bus. Claim 1 expressly refers to the possibility that messages on the message bus may be "generated by the farming vehicle or the farming implement" [emphasis added]. Claim 1 requires the *application program* to extract content from messages *transmitted on the message bus*, which content is then used to perform the *match*. However, it does not restrict the source of those messages.

[178] This construction is confirmed when reading the claims in the context of the disclosure. The disclosure describes the relay device as being connected to a message bus, which again carries messages "generated by the farming vehicle or the farming implement" [emphasis added]. These messages are identified as "480A – 480N" in Figure 4 and the discussion of Figure 4. The disclosure goes on to note that the application program on the device causes the microprocessor "to monitor the messages 480A – 480N transmitted over the message bus 475, and automatically extract certain content from the messages 480A – 480N" for purposes of the *match*. This reference to extraction of content from the messages that may be generated by the farming vehicle *or* the farming implement suggests that the messages from which content is extracted need not be sent by the farming implement.

[179] More significantly, the parties disagree about the nature of the extracted content that must be used to determine that there is a *match* between the *farming implement* and the *known farming implement* in the *implement profile*. Farmers Edge takes the position the information must be the *manufacturer code*, *device class*, and *version* referred to in element 1(d): Ault First Report, Appendix A, pp 179–180; Ault Sixth Report, paras 10–14; Transcript, Day 8, pp 64–65 and Day 9, pp 38–39. Farmobile argues Claim 1 is not so limited, since the claim does not specify the extracted content on which the *match* is to be based: Edwards First Report, para 80; Edwards Second Report, para 57; Transcript, Day 3, pp 10–11.

[180] In my view, the key to resolving this disagreement lies in a purposive construction of Claim 1, that is, one that focuses on the purpose of the elements of the claim and reads the language of the claim in light of that purpose. As the Federal Court of Appeal has stated, "[p]urposive construction relates 'not only to the overall purpose of the invention, but also to the purpose of the various components'": *Evolution Technologies Inc v Human Care Canada Inc*, 2019 FCA 209 at para 20, citing Donald H MacOdrum, *Fox on the Canadian Law of Patents*, 5th ed, looseleaf (Toronto: Thomson Reuters, 2013) at para 8:6(h).

[181] The purpose of the *match* is to allow the device or system to know which farming implement is being used and, through the *communication protocol* stored for that implement, to know how it communicates. This is evident from the claim itself, particularly elements 1(e)(i) and (ii) read together, and is set out expressly by the inventors in the passages of the disclosure reproduced at paragraph [168] above.

[182] Element 1(e)(i) states that the *match* being determined is between the *farming implement* performing the *farming operation* on the one hand and the *known farming implement* of the *implement profile* on the other. The *match* thus expressly invokes the *implement profile*. The only requirements of the *implement profile* of Claim 1 are that it define, for a *known farming implement*, a *known manufacturer code*, a *known device class*, a *known version*, and a *known communication protocol*. The *known communication protocol* is used, after the *match*, to understand the data so the program can determine a *set of operating events* and a *travel path*, as discussed below. However, the only possible purpose of the *known manufacturer code*, *known device class*, and *known version* is involvement in the *match*. If these elements were not used to determine there is a *match*, they have absolutely no function in Claim 1.

[183] The parties agree that it is an essential element of Claim 1 that the *implement profile* have a *known manufacturer code*, *known device class*, and *known version*. To what purpose? The fact that they are included in the *implement profile* for the *known farming implement*, which is what the *farming implement* is being matched with, suggests that they are used in the *match.* No other use for them is found in Claim 1: Ault First Report, Appendix A, pp 179–180; Ault Third Report, paras 111–113.

[184] In particular, I agree with Farmers Edge that there is no apparent use for such data to determine a *set of operating events* or a *travel path*, or to determine the *farming operation* occurred on the *farming operation land segment*, notwithstanding Dr. Edwards' vague reference to possibly using them as "part of a larger algorithm that is handling these large and complex datasets": Transcript, Day 4, pp 82–83. This reference was raised for the first time by

Dr. Edwards in cross-examination. It was unsupported by any explanation as to how a skilled reader would understand the *manufacturer code*, *device class*, or *version* to be used or useful in determining the *set of operating events*, *travel path*, or localizing the *farming operation*. Dr. Edwards contended that there was nothing in the ’742 Patent that restricted or prevented the use of these parameters for purposes other than the *match*, but he gave no evidence as to what the skilled reader would understand their purpose to be in Claim 1 other than matching. To the contrary, in addressing issues of validity, Dr. Edwards asserted that “the fundamental purpose of the implement profile from the 742 patent […] is to identify a communication protocol to be used to understand messages generated by the implement”: Transcript, Day 3, p 45. Nor did Dr. Edwards describe any known or common use for these parameters that the skilled reader would understand from their CGK, other than identifying a farming implement.

[185] Beyond this reference from Dr. Edwards to a “larger algorithm,” there was no expert evidence regarding what a skilled reader would understand the purpose of having the *manufacturer code*, *device class*, and *version* in the *implement profile* to be, other than for the *match*. Mr. Ault recognized that Claim 1 did not expressly define how the *match* was to be performed, but stated that the skilled reader would understand from their presence in the *implement profile* that their purpose was to be involved in the *match*: Ault First Report, Appendix A, pp 179–180; Transcript, Day 9, p 38. This is consistent with the knowledge and understanding of the skilled reader that under the ISO 11783 standard, the purpose of the NAME field containing the manufacturer code and device class is for devices connected to the message bus to identify what other devices are connected: Transcript, Day 4, p 60.

[186] In this regard, Farmobile's efforts in closing submissions to explain what other purpose the *known manufacturer code, known device class,* and *known version* might have in Claim 1—said to pertain to the fact that the same manufacturer may use different communication protocols for different implements or different generations of implement—were unpersuasive, unsupported by the experts, and difficult for the Court to understand as somehow being unrelated to the *match*: Transcript, Day 12, pp 19–25. They are also inconsistent with the fact that Claim 1 only requires a single *implement profile,* a matter discussed below.

[187] Looking beyond Claim 1 for potential guidance, there is similarly no use for these elements found in the other claims or the disclosure of the '742 Patent. There is no discussion anywhere in the patent of using the *manufacturer code*, *device class*, or *version* for any purpose other than in determining a *match*. Conversely, there is no discussion in the patent of determining the *match* using anything but the *manufacturer code, device class,* or *version* that might indicate that the *match* could be performed in a different way while leaving the parameters in the *implement profile* unused.

[188] The claims are certainly not limited to embodiments expressly described in the disclosure: *Bombardier Recreational Products Inc v Arctic Cat, Inc*, 2018 FCA 172 at paras 40–47, lv to appeal ref'd 2019 CanLII 42339 (SCC). Thus, the absence of any other indication in the disclosure as to how else the invention might use the *manufacturer code*, *device class*, and *version,* or how else the *match* might be performed, does not itself dictate a particular construction. However, its absence means there is nothing in the disclosure that contradicts the construction that a skilled reader would put on the phrase *determine that there is a match* based

on the presence of the parameters in the *implement profile*. Nor is there anything in the disclosure that positively supports a construction of *match* that would render the *manufacturer code*, *device class*, and *version* in the *implement profile* purposeless.

[189] Farmobile points to the words "for example" used at page 24 of the disclosure to introduce a method of matching effectively equivalent to that in Claims 2 and 21, and argues this suggests there are other methods of matching not using the *manufacturer code*, *device class*, and *version*, parameters. However, as noted above at paragraph [142], this method of matching using these parameters is indeed just one example of matching using the parameters, namely matching all three parameters using data from a specified source and with a particular type of *version*. Farmobile's similar reliance on the words "such as" on page 26 is, in my view, misplaced, as it is referring to information extracted from an *address claim message*, and the only information ever referred to in the claims as being extracted from an *address claim message* is the *manufacturer code* and *device class* (in Claims 2, 21, and 40).

[190] Further, and contrary to Farmobile's submission, the potential for serialization of the *relay device* discussed in the disclosure gives no indication that such serialization is to be either stored in an *implement profile*, associated with an *implement profile*, or used to determine the *match*. Rather, the disclosure refers to the *relay device* being "[i]deally" serialized so the *farming data exchange system* can uniquely identify every device attempting to connect and upload farming data: Transcript, Day 9, pp 34–37. This reference has nothing to do with the *implement profile*, the matching step, or the *communication profile* of the *farming implement*, and there is no indication that such a serial number would be part of a message transmitted on the message

bus. Farmobile's efforts to pluck this reference out of a discussion of different matters in the disclosure to suggest it affects the construction of the matching step are unconvincing. Again, it is telling that Farmobile's own expert, Dr. Edwards, did not suggest the skilled reader would understand this passage in the disclosure as suggesting that a serial number on the *relay device* could be used as a basis to determine the *match* between the *farming implement* performing the operation and the *known farming implement* of the *implement profile*.

[191] It is possible, of course, for an inventor to include in a claim an essential element that has no purpose at all in the operation of the invention as claimed. However, a purposive approach to construction should not readily reach this conclusion.

[192] In my view, a purposive construction of the requirement of element 1(d)(iii) [that the *implement profile* contain a *known manufacturer code*, a *known device class*, and a *known version*] and the requirement of element 1(e)(i) [that the program determine that there is a *match* between the *farming implement* being used and the known one in the *implement profile*] is that one or more of the *known manufacturer code*, *known device class*, or *known version* are used in the process of determining the *match*. I say "one or more" because I do not agree with Mr. Ault that the required presence of all three parameters in the *implement profile* means that all three must be used in determining a *match*: Ault Third Report, para 113. While the result may be that *some* parameters remain "unused" in the matching process, I do not consider that this results in the same lack of purpose as if *none* of the three is used. This is particularly so given that Claim 2 adds a limitation of a specific method of determining a *match* that uses all three parameters.

"interoperability"

[193] An additional issue arising from the requirements for an *implement profile* and a *match* is the issue of interoperability. Interoperability in this context relates to the ability of different farming equipment—and in particular equipment from different manufacturers, which may send data in different formats, including proprietary formats—to communicate and work together. As discussed above, the ISO 11783 standard sought to address the question of interoperability, although this promise "has not been borne out perfectly in reality," since the standard allows manufacturers to use proprietary messages, and they often do: Ault First Report, paras 112, 122; Edwards Second Report, para 24. Dr. Edwards and Farmobile contend that the '742 Patent is directed to the issue of interoperability and that this affects the construction of the claims. This issue becomes particularly relevant in assessing certain of the parties' invalidity arguments.

[194] The *memory storage area* of Claim 1 must contain an *implement profile*, which must define, for a *known farming implement*, a *known manufacturer code*, a *known device class*, a *known version* and a *known communication protocol*. Farmers Edge argues that this use of the singular means that the *memory storage area* need only contain a single *implement profile* to fall within Claim 1, although it could contain more than one. Dr. Edwards fully agreed with this proposition: Transcript, Day 4, pp 17–19. However, Dr. Edwards also contended that in order to fall within the scope of the claim, the *implement profile* "must serve the purpose of interoperability": Transcript, Day 4, pp 19–30. On this interpretation, the *relay device* of Claims 1 and 20 must at least be *capable* of having more than one *implement profile*: Transcript, Day 4, pp 27–29, 116.

[195] Farmobile adopted this construction in closing submissions. In Farmobile's submission, it is implicit in Claim 1, and in the step of determining a *match*, that "you're going to have more than one [implement profile], at some point, that the system will be capable of having more than one implement profile": Transcript, Day 12, pp 38–42; 105–107, 166–170; Farmobile Closing Submissions, paras 111–112; Farmobile Responding Submissions, paras 94–95. It was similarly Farmobile's position that it is essential to the invention, implicit in the matching step, that there be an "intention" to have a collection of *implement profiles*: Transcript, Day 12, pp 30–31, 39–40, 42, 107. Farmobile went so far as to argue that a device with a single *implement profile* might fall within Claim 1 or not fall within Claim 1, depending on (i) whether a series of other *implement profiles* are housed elsewhere on a server system; or (ii) whether the intention was to just use the single *implement profile*, or to accommodate a plurality of *implement profiles*: Transcript, Day 12, pp 38–40, 107, 167. On Farmobile's argument, a purposive construction must take into account the purpose of the *match*, which is related to the goal of interoperability.

[196] I cannot accept this argument. In my view, Claim 1 of the '742 Patent, like the other claims, refers only to *an implement profile* pertaining to *a known farming implement*. A device or system could certainly include multiple *implement profiles* and still fall within the claim. The claim is thus not limited to a device with a single *implement profile*. However, the claims do not include a requirement that the device be capable of having multiple implement profiles, still less to a third party's intention to have such profiles. The important notice function of the claims would not be met if a given device might fall or not fall within the scope of Claim 1 depending on features not identified in the claim or depending on the owner or manufacturer's intention. A

purposive approach to construction does not require or permit that such significant new essential elements be read into the claim through the reference to the *match*.

[197] Notably, the inventors appear to have made a clear choice to only include reference to a single *implement profile* in the claims of the ’742 Patent. The disclosure refers in a number of places to a “collection of implement profiles” for a “collection of known farming implements.” Nonetheless, in the claims, the inventors chose to define their monopoly with reference to *an implement profile* defining parameters for *a known farming implement*. The importance of claim language requires that this apparently deliberate choice be respected. In any case, to the extent the inventors intended to include the idea of a collection of implement profiles in their claims but did not do so, any resulting “troublesome limitation” in the claim would amount to a “self-inflicted wound”: *Free World Trust* at para 51. The public must be able to rely on the words of the claims, interpreted fairly and knowledgeably: *Free World Trust* at para 51. The words of Claim 1 cannot be fairly interpreted as requiring there be the potential for multiple *implement profiles*, or an “intention” to go beyond the terms of the claim to incorporate other unclaimed elements such as additional implement profiles.

[198] In its closing submissions, Farmobile referred to a statement made by Mr. Ault in a report he prepared in the Nebraska Litigation. In the report, Mr. Ault gave his opinion on the extent to which the US patent application and Canadian patent were based on work done by the inventors while they were at Crop Ventures, the company that first developed the CanPlug and was acquired by Farmers Edge: Edwards Seventh Report, Appendix A [Ault Nebraska Report], p 1. At the outset of this report, Mr. Ault noted that the US patent application had been amended to

clarify the intent to have a "plurality of implement profiles" as opposed to a single implement profile. In Mr. Ault's view, this did not materially change the US patent application, "since the described act of matching an implement to an implement profile clearly implies that there are multiple profiles from which a matching one was intended to be found" [emphasis added]. For this reason, Mr. Ault focused his report on the original language in his analysis. Farmobile argues this observation from Mr. Ault supports their argument that the *implement profile* of Claim 1 must be capable of being one of many potential *implement profiles*.

[199] I am not persuaded that this reference in Mr. Ault's report from the Nebraska Litigation materially affects matters. While Mr. Ault gave his view in that report that the matching step implies there are multiple profiles from which to match, he did not give his view that it was an essential element of Claim 1 of the Canadian patent that the relay device have not only *an implement profile*, but be capable of having multiple *implement profiles*. This passage from Mr. Ault's Nebraska report was not put to him in cross-examination, despite his statement that "[t]he claims of the patent don't say anything about multitude of implements": Transcript, Day 8, pp 158–159.

[200] In any event, even if that were Mr. Ault's view, I remain unable to find in Claim 1, either in the phrase *determine that there is a match* or elsewhere, a requirement that in addition to the stated need for *an implement profile*, there be a capability or intention to store or access a plurality of *implement profiles* or a collection of *implement profiles*.

[201] As the experts recognize, the issue of having to reverse engineer *communication protocols* is discussed in the disclosure of the ’742 Patent, albeit not in those terms. The disclosure refers to the “implement profiles in the collection of implement profiles” providing a “mapping” between ECU parameters and ISO virtual terminal object numbers. Once the implement is identified, the system knows all of the object numbers that will be used by the implement to communicate information, so can extract operating parameter values. This effectively defines a type of *communication protocol* based on virtual terminal object numbers, one of four sources of information in an ISO 11783 message stream: Ault First Report, para 123. The process of determining what virtual terminal object numbers are associated with what parameters is the type of reverse engineering the experts agreed would be in the CGK of the POSITA.

[202] However, the potential need to determine what object numbers are associated with what operating parameters (the reverse engineering) in order to determine a particular implement’s *communication protocol* does not make this part of the claims of the patent. The claims do not refer to the process of determining or developing the *communication protocol*, which the parties agree was part of the CGK. Nor do they require the *communication protocol* to be a proprietary *communication protocol* that has been derived from determining the association between virtual terminal object numbers to operating parameters in particular.

[203] Purposive construction requires the claims, and the terms used in them, to be read with an eye to their purpose; it does not permit using “purpose” as a basis to create new essential

elements not found in the claim or to give the claim a reading that is contrary to its language: *Free World Trust* at para 31(a)–(e).

[204] In this regard, there is a difference between concluding, as I have, that the POSITA would understand the phrase *determine that there is a match* in a way to give other essential elements within Claim 1 a purpose (*i.e.*, the *manufacturer code*, *device class*, and *version*) and concluding that the POSITA would understand the phrase to incorporate a new essential element (the need to "serve the purpose of interoperability," or the potential or intention to have multiple *implement profiles*) that is not found in the claim language and appears to have been deliberately left out of the claim language by the inventors.

> (ii) use the extracted content, the position and time signals and the known communication protocol defined by the implement profile for the known farming implement to determine a set of operating events and a travel path for the farming operation

[205] Having determined a *match* with the *known farming implement* of the *implement profile*, thereby knowing its *communication protocol*, the *application program* is in a position to understand the other data extracted from the messages transmitted on the message bus. It uses this extracted content, together with the position and time signals obtained by the GPS, to determine a *set of operating events* and a *travel path* for the *farming operation*.

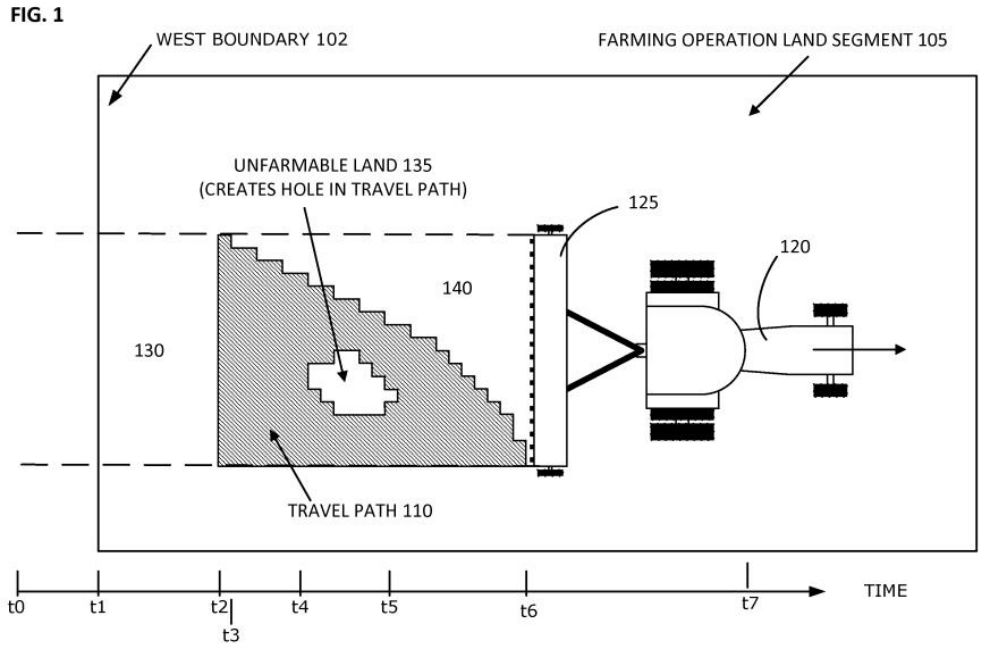
[206] The '742 Patent distinguishes between *operating events* and *operating parameters*. An *operating parameter* is data regarding the farming sent by the *farming implement* such as a sprayer's on/off status, the total volume of spray applied, or the flow rate associated with a

particular nozzle. An *operating event* is effectively something occurring during the *farming operation*. Both experts referred to the examples given in the disclosure of the ’742 Patent, which include activating or deactivating either the *farming implement* as a whole or certain sections or row units on it; receiving a signal or instruction from the *farming vehicle*; transmission by the *farming implement* of a signal representing a low-feed, low-fuel, or power-fail condition; or an increase or decrease in volume or pressure readings. As the disclosure indicates, the software derives *operating events* from changes in *operating parameters*. A *set of operating events* is the set of these events during the *farming operation*.

[207] The *travel path* for a *farming operation* is a particular term coined by the inventors to distinguish between where the *farming vehicle* and *farming implement* travel and where farming is actually occurring, *i.e.*, where the *farming vehicle* and *farming implement* travel while actually performing the *farming operation*. The inventors define a *travel path* in similar terms in two places in the disclosure:

> A travel path for a farming operation is a specific area of land on the earth (or in a FOLS) where a farming operation (e.g., planting corn) is performed by the farming vehicle and farming implement. Notably, unlike a FOLS, the travel path does not include any areas of land on the FOLS where the farming operation (planting corn) was not performed during the farming operation.
>
> […]
>
> The travel paths identify areas on the FOLS where the farming vehicle and farming implement traveled during the farming operations with the farming implement activated and engaged, and does not include areas of land on the FOLS where the farming vehicle and farming implement either (a) did not travel during the farming operation, or (b) did not travel while the farming implement was activated and engaged.

[208] As a result, a map representing the *travel path* for an operation would cover areas where the *farming vehicle* and *farming implement* traveled while the *farming operation* was actually occurring, and would have a hole or gap in it corresponding to the portion of the field where the operation did not occur, such as where corn was not planted owing to, for example, an obstacle or unfarmable conditions. Figure 1 of the ’742 Patent provides a diagram illustrating exactly this:



[Description of image: A rectangle is labelled as representing a “FARMING OPERATION LAND SEGMENT 105”, with the left border of the rectangle labelled “WEST BOUNDARY 102.” Within the rectangle is an overhead diagrammatic depiction of a tractor (labelled “120”) pulling a farming implement (labelled “125”). An arrow shows the tractor as moving from left to right. The land over which the implement has travelled is bordered by dotted lines. Behind the farming implement, within the dotted lines, a regtangular area is subdivided into an irregular shaded area labelled “TRAVEL PATH 110” and an irregular white area labelled “140.” An irregular white space within the shaded area is labelled “UNFARMABLE LAND 135 (CREATES HOLE IN TRAVEL PATH).” Below the rectangle, an axis labelled “TIME” includes markings numbered from “t0” to “t7.”]

[209] The experts agree the POSITA would understand the term in accordance with this definition: Edwards First Report, paras 86–87; Ault First Report, paras 16, 47, 52. The definition accords with the language of Claim 20, which states that the *travel path* includes “only those areas of land on the farming operation land segment where the farming vehicle and farming

implement traveled while performing the farming operation, and does not include any areas of land on the farming operation land segment where the farming vehicle and farming implement did not travel during the farming operation." While this language does not appear in Claim 1, the parties agree that this is how the POSITA would equally understand the term *travel path* as it is used in Claim 1.

[210] Similarly, dependent Claim 4 claims a relay device of Claim 1 with certain additional limitations, one of which is that "the travel path for the farming operation includes only those areas of land where the farming vehicle and farming implement traveled while the farming implement was not in the deactivated state, and does not include any areas of land where the farming vehicle and the farming implement either (i) did not travel during the farming operation, or (ii) traveled while the farming implement was in the deactivated state." Again, this definition entirely accords with the parties and experts' mutual understanding of a *travel path*, rendering this limitation effectively redundant. As mentioned above, no party suggested that because the *travel path* of Claim 4 contained this express limitation, the *travel path* of Claim 1 should not be read to include this limitation.

> (iii) use the set of operating events, the travel path and the descriptive information stored in the memory storage area to determine that the farming operation occurred on the farming operation land segment

[211] In this step, whose construction is not in dispute, the computer program uses the *set of operating events* and the *travel path* it determined in step (ii), together with the descriptive information in memory (*i.e.*, the descriptive information about the FOLS) to determine that the

farming operation occurred on the FOLS. In essence, the program compares the information about the farming that was performed to determine that it was done on a particular piece of land stored in the device's memory: Ault First Report, Appendix A, pp 182–183; Edwards Second Report, paras 70–71.

> (iv) record the farming operation and the descriptive information for the farming operation land segment in the electronic farm record

[212] In the final step of Claim 1, the computer program records the *farming operation* and the information about the FOLS in the EFR. Again, there is no dispute between the experts that this simply means the program stores the information about the *farming operation* and the associated FOLS in the relevant EFR: Ault First Report, Appendix A, p 183; Edwards Second Report, para 72.

[213] The sum of the foregoing, with focus on the elements in dispute, is that Claim 1 claims a *relay device* comprising:

(a) a *microprocessor*;

(b) a *bus connector* for connecting it to a *message bus* (not just an ISOBUS) on farming equipment;

(c) a GPS receiver;

(d) memory that stores (i) an EFR; (ii) descriptive information about a FOLS; and (iii) a (single) *implement profile* defining, for a known implement, a *known manufacturer code* (as that term is used in the ISO 11783 standard), a *known device class* (as that term is used in the ISO 11783 standard), a *known version* (which may be an object pool version

or may be another sort of version), and a *known communication protocol* that describes the meaning, format, and encoding of messages the implement uses to communicate farming operation data (the "language" it speaks); and

(e) software that will *automatically*, but not necessarily without human intervention,

(i) extract content from messages on the *message bus*, to determine there is a *match* between the implement doing the farming and the implement in the *implement profile* (using at least one of the *manufacturer code*, *device class*, and *version* in the profile); (ii) use the data from the messages, the GPS information, and the *communication protocol*, to determine a *set of operating events* and a *travel path*; (iii) use the *set of operating events*, the *travel path*, and the information about the FOLS to determine that the farming occurred on the FOLS; and (iv) record the *farming operation* and the information about the FOLS in the EFR.

[214] The parties agree that the foregoing elements are all essential elements of Claim 1. However, there remains a final disputed construction issue with respect to Claim 1: whether the location these elements (*i.e.*, on the device itself or off the device) is essential.

(f) *Essentiality and Farmers Edge's objection to the Edwards Sixth Report*

[215] In his Sixth Report, Dr. Edwards gave his opinion that the location of the processor and the memory that perform certain elements of Claim 1 is not an essential element of the claim: Edwards Sixth Report, paras 98, 107; see also Edwards Seventh Report, paras 10–11. In particular, he pointed to element 1(d)(ii) [the memory storage area stores descriptive information about a FOLS]; element 1(e)(iii) [the program determines the *farming operation* occurred on the FOLS]; and element 1(e)(iv) [the program records the *farming operation* and descriptive

information for the FOLS in the EFR]. In Dr. Edwards' view, the skilled reader would understand it is essential that these elements be present, but it is *not* essential that the memory storage area and the processor performing these functions be on the *relay device* as opposed to another computer: Edwards Sixth Report, para 107; Transcript, Day 3, pp 26–28.

[216] Farmers Edge objected to this opinion on essential elements being put forward for the first time in Dr. Edwards' Sixth Report. The objection was originally raised by pre-trial motion, but it was subsequently agreed the issue would be determined at trial, with Farmers Edge maintaining its objection to this aspect of Dr. Edwards' Sixth Report and his evidence on the issue. Farmers Edge argues that raising a new construction issue late in the day, after it had filed expert reports and amended its software in response to Dr. Edwards' earlier reports, amounts to improper case splitting. It also argues that raising this issue after the Court refused leave to Farmobile to amend its pleading to allege that Farmers Edge's system operated in a manner that was "functionally equivalent to the previous system" amounts to an abuse of process: *Farmobile, LLC v Farmers Edge Inc*, 2022 FC 22 [*Farmobile (2022)*] at paras 34–43, aff'd on other grounds 2022 FCA 116. Farmobile responds that it was timely to raise the essentiality issues when the variant at issue was identified, citing *Halford (FCA)* at para 16; *Lilly Tadalafil* at para 191; and *Actavis UK Limited et al v Eli Lilly and Company*, [2017] UKSC 48 at paras 54-56 and 62. It also argues that its position on essentiality is not precluded by *Farmobile (2022)*.

[217] I agree with Farmobile that its position on essentiality is not precluded by my decision in *Farmobile (2022)*, which refused to permit an allegation phrased as a "functional equivalence" argument for lack of material particulars: *Farmobile (2022)* at paras 40–42. At paragraph 43 of

that decision, I noted that a pleading amendment may not be necessary in exactly the case that has arisen, namely where a defendant's expert asserts that a product does not contain a claim element, and the plaintiff's expert asserts that the element is not essential: *Farmobile (2022)* at paras 40–43. My decision on the pleadings amendment did not preclude the argument Farmobile now makes on essentiality.

[218] The concern about timing and case splitting is more complex. For the reasons below, I conclude I do not need to decide Farmers Edge's objection on this ground. Even admitting Dr. Edwards' evidence on this issue, Farmobile has not met its burden to show that the location of these aspects of the memory and processing in Claim 1 is not essential. However, since the context in which Dr. Edwards's opinion on the issue arose affects the weight I am prepared to give to that opinion, albeit not determinatively, I will set out that context before turning to the merits of the essentiality arguments.

(i) Context

[219] Dr. Edwards did not address whether claim elements were essential or inessential either in his First Report, where he construed the Asserted System Claims, or his Second Report, where he construed the remaining claims. While his First Report sets out the instructions counsel gave him regarding principles of patent construction, these instructions do not include any reference to essential elements. This was apparently because Dr. Edwards was not given instructions on essentiality, although he also said he did not address essentiality in his early reports because it was "unnecessary to do so": Edwards Sixth Report, para 87; Transcript, Day 4, pp 95–96; 225–226; Transcript, Day 13, pp 3–4, 6–8.

[220] In the Court's experience, this is unusual. As the Supreme Court of Canada noted in *Whirlpool*, the identification of essential elements is the "key" to purposive construction: *Whirlpool* at para 45; see also *Free World Trust* at paras 15, 31(e); *Tearlab* at para 31; *Biogen* at para 74. For an expert to be instructed on principles of claims construction without any reference to the key notion of essential elements leaves out an important aspect of the Court's task with which the expert's evidence is supposed to assist. Indeed, a claim element will be presumed essential unless a party maintains that it is not essential, such that the absence of expert evidence on the issue may be highly relevant: *Corlac Inc v Weatherford Canada Inc*, 2011 FCA 228 at paras 26–27; *Allergan Inc v Sandoz Canada Inc*, 2020 FC 1189 at para 46. It may be that, as Farmobile's counsel submitted, counsel had determined that essentiality was not at issue at the time of Dr. Edwards' early reports. However, whether or not a defendant's product is alleged to have all of the elements in the claim (regardless of whether they are essential), the identification of essential elements remains an important part of claims construction, and consequently in assessing infringement and validity. It is therefore surprising that Dr. Edwards was apparently not even instructed on the issue of essential elements in addressing these issues in his early reports.

[221] In any event, Dr. Edwards' First Report opined the FarmCommand system infringed the Asserted System Claims. As part of his response to that opinion, Mr. Ault proposed modifications to FarmCommand he said would result in the system not infringing, even on Dr. Edwards' construction: Ault Second Report, paras 131–146. These included several options for changing the architecture by moving certain data processing functions to the CanPlug, and a further option based on Mr. Ault's construction of the term *automatically*, discussed at

paragraphs [170] to [174] above. In addition to giving his opinion that the resulting system would not infringe the Asserted System Claims, Mr. Ault observed briefly that the CanPlug would not infringe Claim 1 or any device claims: Ault Second Report, paras 133, 140, 142, 144, 145. Mr. Ault went on to give cost estimates to implement these "non-infringing alternatives": Ault Second Report, paras 149–169.

[222] Dr. Edwards responded to these alternatives in his Third Report, in September 2020. He gave his opinion that the architecture changes Mr. Ault proposed (i) would significantly degrade the quality, performance, and usefulness of the FarmCommand system; and (ii) would fundamentally alter the basic architecture of the system, requiring an extensive redesign of hardware and software components, such that Mr. Ault's cost estimates were unreliable: Edwards Third Report, paras 6–37. Although Dr. Edwards opined that the changes based on the term *automatically* did not change his opinion on infringement, he gave no similar opinion with respect to the other architecture changes: Edwards Third Report, para 38.

[223] In April 2021, Farmers Edge implemented one of the options for an architecture change proposed by Mr. Ault, moving certain functions onto the CanPlug. Mr. Ault confirmed his opinion that after this April 2021 Update, the "split architecture" of the CanPlug and FarmCommand did not infringe any claim of the '742 Patent: Ault Fourth Report, para 6. This resulted in the adjournment of the trial of this matter, which had been scheduled to begin on April 19, 2021.

[224] In July 2021, Dr. Edwards gave his opinion that after the April 2021 Update, the CanPlug infringed the Asserted Device Claims: Edwards Fifth Report, paras 11, 39. Farmobile amended its Statement of Claim to assert the Asserted Device Claims. Farmobile accepts that FarmCommand does not infringe the Asserted System Claims after the April 2021 Update, subject to arguments about implementation and stand-by utility.

[225] In response to Dr. Edwards' Fifth Report, Farmers Edge implemented the July 2021 Update. In this update, certain functions that were previously performed on the CanPlug were removed from the CanPlug to be performed on FarmCommand servers. In particular, a function that determined the field on which farming was occurring, identified by Dr. Edwards as meeting the requirement of element 1(e)(iii), was removed from the CanPlug, together with certain associated functionality. Mr. Ault gave his opinion that the "new split architecture" implemented in the July 2021 Update resulted in the CanPlug not infringing the Asserted Device Claims, even on Dr. Edwards' construction: Ault Fifth Report, paras 108–121.

[226] Dr. Edwards assessed the July 2021 Update in his Sixth Report. In doing so, he gave his opinion, for the first time, that the location of the memory and processor that perform elements 1(d)(ii), 1(e)(iii) and 1(e)(iv) was not an essential element of Claim 1 and its dependent claims. As a result, he considered that the removal of functions from the CanPlug implemented in the July 2021 Update did not affect his view that the Asserted Device Claims were infringed: Edwards Sixth Report, paras 98–107, 115–116, 121–124.

(ii) Farmobile's position on the essential elements of Claim 1

[227] The scope of Farmobile's position with respect to the essential elements of Claim 1 was clarified in closing submissions. Farmobile recognizes it is an essential element of Claim 1 that the *relay device* have a *memory storage area* on it, as required by element 1(d), and that it is also essential that the *memory storage area* have "something" stored in it. However, it contends that each of the three things that Claim 1 refers to the *memory storage area* storing—namely the *electronic farm record* [element 1(d)(i)]; the descriptive information about a *farming operation land segment* [element 1(d)(ii)]; and the *implement profile* [element 1(d)(iii)]—may be stored elsewhere: Transcript, Day 13, pp 8–12. On Farmobile's construction, as long as at least some of this data is stored in the *memory storage area* on the device, the essential aspects of element 1(d) are met, even if all of the other data is stored elsewhere.

[228] Similarly, Farmobile recognizes it is essential that the *microprocessor* on the *relay device* of Claim 1 have an *application program* that performs at least some of the functionality in the four sub-elements of element 1(e). However, it argues that any portion of the functionality short of the entirety of it could be performed off the device and still meet the essential elements of the claim: Transcript, Day 13, p 12.

[229] Farmobile notes that if *all* of the processing functionality were moved off the device, then the system would fall within Claim 20, in which (as Farmobile accepts), it is essential that all of the functions of the *application program* of element 20(f) be performed off the *remote relay*

device, which is remote to the claimed system: Transcript, Day 13, p 12; Edwards First Report, paras 44, 53, 58, 76–77.

[230] On this last point, it is worth underscoring that Farmobile's arguments about essentiality relate only to the device claims, namely Claim 1 and its dependent claims. Farmobile's position is that the location of the data storage and processing in Claim 20 is essential, in that it must be off the *remote relay device*. However, it argues that in Claim 1, it is not essential whether the storage and processing occurs on or off the *relay device*.

[231] Farmobile also argued, for the first time in closing oral submissions, that to the extent the Court construes element 1(e)(i) (*determine that there is a match*) as involving the *known manufacturer code*, *known device class*, and/or *known version*, as I have done above, then the use of these parameters in the *match* is not essential. However, this amounts to no more than a re-argument of its position on the construction of the term and was not supported by any evidence going to the relevant essentiality issues. I reject the argument.

(iii) Principles

[232] As noted, the identification of the particular words or phrases in the claims that describe what the inventor considered to be the essential elements of their invention is the "key" to purposive construction: *Whirlpool* at para 45. Unless a party maintains that a claim element is not essential, it will be considered essential, with the onus being on the party alleging it is non-essential to establish this: *Free World Trust* at para 57; *Corlac* at paras 26–27; *Pollard Banknote* at para 74; *Allergan* at para 46.

[233] The determination of whether an element is essential is done (i) on the basis of the CGK; (ii) at the date of publication; (iii) with regard to whether it was obvious that substitution of a variant would not make a difference to the way the invention works; (iv) according to the expressed or inferred intent of the inventor; and (v) based on the patent specification without resort to extrinsic evidence: *Free World Trust* at paras 31(e), 51–67.

[234] Within the third of these principles, the Supreme Court discussed a two-part approach to non-essentiality. For an element to be considered non-essential, it must be shown either (i) that on a purposive construction of the words of the claim it was clearly *not* intended to be essential, or (ii) that at the date of publication of the patent, the skilled reader would have appreciated that the element could be substituted "without affecting the working of the invention," *i.e.*, would they understand that a variant would "obviously work in the same way": *Free World Trust* at paras 52, 55, citing *Improver Corp v Remington Consumer Products*, [1990] FSR 181 (Pat.Ct.) at pp 182, 192. In addressing the "expressed or inferred" intent of the inventor, Justice Binnie adopted the language of Justice Pratte, noting that the Court's role is not to redraft the claims and that "[w]hen an inventor has clearly stated in the claims that he considered a requirement as essential to his invention, a court cannot decide otherwise for the sole reason that he was mistaken": *Free World Trust* at para 59, adopting *Eli Lilly & Co v O'Hara Manufacturing Ltd*, [1989] FCJ No 408 at para 20.

(iv) The location of storage and processing in Claim 1 is essential

[235] Farmobile argues the factors set out in *Free World Trust* indicate that the location of the memory and computer processing responsible for claim elements 1(d)(ii), 1(e)(iii) and 1(e)(iv) is

not essential. It claims the POSITA would have known at the date of publication that some data storage and processing that occurs on embedded devices can be performed on remote servers, and notes that the experts agreed that it was common that "design decisions" would be made about where such storage and processing occurred: Edwards Sixth Report, paras 99–100; Transcript, Day 8, pp 121, 158. It therefore argues the POSITA would have appreciated that having some memory and processing occur on a server would have no material or significant effect on how the device functions.

[236] For the following reasons, I am not persuaded. In my view, a review of the '742 Patent as a whole, the claim language in the context of the patent, and the expert evidence shows that the location of storage and processing is essential to Claim 1. The patent as a whole, including the claims, shows the inventors intended the location of storage and processing to be essential. The evidence also does not establish that moving storage and processing functions from the *relay device* of Claim 1 to a server would have no effect on the working of the invention such that it would obviously work "in the same way."

[237] On its face, Claim 1 claims a physical *relay device* that comprises several elements, including a *microprocessor*, a *memory storage area* that stores an EFR, descriptive information about a FOLS, and an *implement profile*; and an *application program* comprising instructions that cause the *microprocessor* to perform certain steps. The claim does not itself suggest, or appear to permit, that the *memory storage area*, or the information in the *memory storage area*, might be located somewhere other than the *relay device* and simply be accessed by the device, presumably through some form of (unclaimed) communication method. With the focus being on

the language of the claims, it is difficult to see how a device that does not have, for example, memory containing descriptive information about a FOLS could meet the requirement of "A relay device […] comprising […] a memory storage area that stores […] (ii) descriptive information about a farming operation land segment associated with the farming business."

[238] Similarly, element 1(e) requires the *application program* to comprise instructions that cause the *microprocessor* to take certain steps. The reference to "the *microprocessor*" can only be read as the *microprocessor* of element 1(a), namely that on the *relay device*. The claim does not itself suggest, or appear to permit, that the *application program,* instead of causing that *microprocessor* on the *relay device* to perform the functions, might cause that *microprocessor* and/or another (unmentioned) *microprocessor* not located on the device to perform the functions.

[239] However, as Farmobile argues, the fact that the claim itself appears to refer to elements 1(d) and 1(e) as being elements that the device comprises cannot be the complete answer. Otherwise, any claim element appearing in the claim would be essential by definition, which *Whirlpool* teaches is not the case: *Whirlpool* at paras 45–50. That said, the inventor's own identification of the essential elements through both its disclosure and its claim language is an important aspect of the analysis: *Whirlpool* at para 45, citing *JK Smit & Sons, Inc v McClintock*, 1939 CanLII 50 (SCC), [1940] SCR 279 at p 285.

[240] Notably, unlike Claim 1, dependent Claim 13 does expressly include limitations involving a *data communications channel* for communication with a *farming data exchange system*, as well as an *exchange interface module* that is operable with the *memory storage area*

and the *microprocessor* to transmit at least a portion of the *electronic farm record* to the *farming data exchange system* via the communications link. The fact that Claim 13 specifically contemplates, as additional limitations, a communications link for communicating with a *farming data exchange system*, and an interface operable to transmit at least a portion of the EFR that is in the *memory storage area* on the *relay device* of Claim 1, confirms the inventors' understanding and intention that the data described in element 1(d) is indeed stored in the *memory storage area* on the *device* and is not already resident elsewhere, such as in the *farming data exchange system*. Notably, even where the involvement of a *farming data exchange system* is contemplated, Claim 13 is drafted to put limitations on the *relay device* itself. It does not include the *farming data exchange system* as an element of the claim: the device must include a *data communications channel* for communication with the system, and an interface operable […] to transmit data. The focus remains, as it is throughout the device claims, on the attributes of the device itself.

[241] This is consistent with the structure of the claims as a whole. The '742 Patent sets out, in both the disclosure and the claims, a number of ways in which the invention may be practiced. All of them involve a *relay device*; computer storage for storing information about an EFR, a FOLS, and an *implement profile*; and a program that uses information in the *implement profile* to understand and process the data being sent to generate information useful to a farmer such as a *travel path*. The inventors sought to protect their invention through two primary types of claims: the device claims of Claims 1 to 19, and the system claims of Claims 20 to 44. Independent Claim 1 claims a *relay device* that has a microprocessor, memory storage, and an *application program* to understand and process the data it acquires. Independent Claim 20 claims a system

that has a microprocessor, memory storage, an interface configured to receive data acquired by the *remote relay device*, and an *application program* to understand and process that data. As Mr. Ault points out, the primary distinction between the device claims and the systems claims is where the information is stored and processed: Ault Sixth Report, para 45; Transcript, Day 8, p 121. In Claim 1, which claims a device and not a system, it occurs on the device. In Claim 20, which claims a system and not a device, it occurs off the device. This certainly does not indicate that the inventors considered the location of the storage and processing immaterial or inessential.

[242] To the contrary, permitting the memory storage and data processing of Claim 1 to occur off the device in a "split architecture" would largely erase the distinction between Claims 1 and 20: Ault Sixth Report, para 35; see also paras 45–56. As Farmers Edge's counsel suggested in closing, it would mean that both Claims 1 and 20 would cover "server and device combinations": Transcript, Day 12, pp 126–128. Farmobile's position is that *some* storage/processing functionality must happen on the device in Claim 1, which would differ from Claim 20, where all of it occurs off the device. However, there is no principled basis for Farmobile's position that each individual element of storage or processing could be moved off the device, as long as not all of it is. If, as Farmobile argues, the POSITA would understand that this functionality could be moved off the device and that the inventors intended Claim 1 to cover such a variation, why could not all of it be similarly moved off the device? There was neither any expert evidence nor any explanation of this, or of the purpose or value of requiring, as Farmobile's construction does, some undefined minimum amount of storage and processing to occur on the device.

[243] In other words, Farmobile's construction is inconsistent with a purposive construction of the claims. On Farmobile's argument, the POSITA is said to know that all of the data storage and processing steps of elements 1(d) and 1(e) could be moved off the device without changing the way the invention works. Nonetheless, in order to make some sense of the claim, Farmobile asserts that the device must continue to have a *memory storage area* and a *microprocessor* performing data processing functions, and that at least some of the data storage and processing must occur on the device, regardless of which portion of it. Farmobile provides no explanation or evidence of there being any practical or technological purpose to requiring some of the data storage and processing to occur on the device even though some or most could be moved off it.

[244] Farmobile and Dr. Edwards point to the disclosure of the '742 Patent, describing it as encompassing the possibility of storage and processing occurring on the device or on the cloud. As Dr. Edwards notes, the disclosure states that embodiments of the invention "provide a passive relay device for farming vehicles and implements, as well as an online farming data exchange, which *together* enable capturing, processing and sharing farming operation data […]" [emphasis added by Dr. Edwards]: Edwards Sixth Report, para 92. Farmobile therefore argues that the patent does not indicate to the skilled reader that it is essential that the storage and processing of Claim 1 be done in one place.

[245] In my view, the disclosure, read as a whole, would not lead the POSITA to conclude that the location of storage and processing in Claim 1 is inessential. The disclosure describes a variety of embodiments of the invention, including embodiments providing a relay device and embodiments providing a system. Beyond the introductory language cited by Dr. Edwards

above, it does not describe embodiments in which some functions are performed on the device and others are performed on the server. As Farmers Edge points out, there is discussion of systems and methods for monitoring message data on a message bus "to detect, identify, extract and store operating parameters exchanged between a farming implement and a farming vehicle during performance of a farming operation." However, the patent contains no method claims and does not claim a system in which the location of storage and processing is irrelevant; Farmobile recognizes that Claims 20 and 38 do not permit the storage and processing to be performed on the device.

[246] Ultimately, what is important is what the inventors have claimed. The patent claims devices and systems, and claims them separately. I cannot conclude that the single reference identified in the passage above would lead a POSITA to read the device claims as allowing elements claimed as being on the device to be located off the device.

[247] Nor, in any event, does the expert evidence support Farmobile's contention that a device on which data storage and processing functions occur on the device and one on which some storage and processing functions occur on the device and others occur on a remote server would obviously work "in the same way." Rather, the expert evidence indicates that the location of where functions such as storage and processing occur in a particular system architecture matters to how the system functions.

[248] As Farmobile points out, Mr. Ault agreed that the POSITA would know as part of their CGK that design decisions must be made regarding where storage and processing occurs, and

that such design decisions were made "all the time about what would run in different places of the system": Transcript, Day 8, pp 121, 158. Indeed, Mr. Ault stated in his First Report that the "first order of business" in a system involving cloud computing systems with "edge" devices out in the field is "always to determine which functions can and should be performed in edge devices and which can and should be performed in the cloud": Ault First Report, para 79.

[249] However, the need for such design decisions, and the POSITA's knowledge of such decisions, does not mean that the location of storage or processing does not affect how the system functions. To the contrary, Mr. Ault's statement that important decisions must be made as to where functions "can and should be performed" indicates that their location matters to the performance of the system.

[250] Dr. Edwards' reports, prior to his Sixth Report, appear to express the same opinion. In his Second Report, Dr. Edwards responded to Mr. Ault's opinion on invalidity, set out in the Ault First Report. In his discussion of obviousness and the prior art identified in the Ault First Report, Dr. Edwards noted that each of the elements and functions combined in the '742 Patent involves "many design possibilities," such that the POSITA trying to build a system "would face a vast field of possible design choices, with complicated trade-offs and interactions among them" [emphasis added]: Edwards Second Report, para 534. These include in particular "[w]hether to use an active task controller […] or passive collection device"; "[w]hether to tightly integrate all necessary components into a single unit […] or create a system that is configurable and flexible"; and "[w]here to store farming data, on the farmer's desktop […], amongst a federated set of databases […] or in the cloud."

[251] Similarly, Dr. Edwards opined that the prior art discussed by Mr. Ault in his First Report did not render the system claims obvious, because it "taught away" from the systems of Claims 20 and 38, which "use a passive relay device and extract content from messages in a server, rather than using an active in-cab monitor or task controller to extract content": Edwards Second Report, paras 289(e), 505(e), 512. While Dr. Edwards conceded that moving the task of extracting content from an in-cab monitor or task controller to a server was "not on its face inventive," he suggested it was important to consider that prior art systems avoided and even disparaged such an approach: Edwards Second Report, para 512. Dr. Edwards' evidence on this issue is thus directed specifically to how differences in system architecture, including where data is stored and processed, affect the working of a system.

[252] Indeed, in his Second and Fourth Reports, Dr. Edwards contended that the inventive concept of the '742 Patent, reflected in each of the independent claims, comprised a "specific unique combination of software, hardware, data, and protocol elements": Edwards Second Report, paras 158–167; Edwards Fourth Report, paras 5(4), 33–36. This included discussion of the particular benefits of using a "passive" relay device with processing entirely on a server, rather than having to import data from a device to a desktop application: Edwards Second Report, paras 161, 163, 166. If the very inventive concept of the patent is said to lie in this "specific unique combination," of software, hardware, data, and processing, this suggests that the particular piece of hardware on which software, data, and processing are located is important to its design.

[253] Dr. Edwards' response to Mr. Ault's Second Report on infringement also underscored the importance of the particular location of system elements. As discussed above, Mr. Ault's Second Report proposed modifications to FarmCommand he viewed as non-infringing, including options for changing the architecture by moving certain data processing functions to the CanPlug: Ault Second Report paras 131–146. Dr. Edwards responded to these alternatives in his Third Report. As indicated, Dr. Edwards opined that the proposed architecture (i) would significantly degrade the quality, performance, and usefulness of the FarmCommand system; and (ii) would fundamentally alter the basic architecture of the system, requiring an "extensive redesign" of both the hardware and software components: Edwards Third Report, paras 6–37.

[254] Dr. Edwards made similar comments in his Fifth Report, addressing the software update that implemented one of these proposed architecture changes, the April 2021 Update. In that report, Dr. Edwards questioned Mr. Ault's assertion that the update would "provide identical functionality." He noted that a Farmers Edge document showed "one of the innumerable ways" that a significant code update could "affect a system's functionality in subtle and unpredictable ways that only become apparent through rigorous testing and actual use": Edwards Fifth Report, para 126. He did not suggest, however, that where the data storage and processing functionality occurred was not essential for purposes of Claim 1.

[255] Farmobile and Dr. Edwards argue there is an important difference between moving storage and processing functionality from a server onto a device (as was the case in the April 2021 Update) and moving storage and processing functionality from a device onto a server (as was the case in the July 2021 Update). The difference is said to lie in the effectively

unlimited storage and processing power available on a server, as opposed to the relatively limited storage and processing power available on an edge device: Edwards Seventh Report, paras 12–13; Edwards Fifth Report, paras 127–129. They argue this difference accounts both for Dr. Edwards' statements in his earlier reports about the importance and impact of architecture changes, and the difference between Claims 20 and 38, where the location of storage and processing is said to be essential, and Claim 1, where it is said to be inessential: Transcript, Day 12, pp 65–67, 72–74.

[256] I cannot agree. The discussion in Dr. Edwards' earlier reports about the significance and importance of architecture changes does not simply relate to issues about moving from the larger storage and processing capacity of servers to the more limited capacity of devices. Dr. Edwards certainly does refer to the memory and processing abilities of servers as opposed to edge devices: Edwards Second Report, para 163; Edwards Third Report, paras 10–18, 36; Edwards Fifth Report, para 127. However, his discussion of the importance of system architecture and design is not limited to this and does not suggest that differences in where memory and processing occur are a "one-way street" in which moving from a server to a device is a significant change, while moving from a device to a server is immaterial. Dr. Edwards stated the following in his initial response to Mr. Ault's proposed architectural changes:

> Mr. Ault's proposal would constitute a fundamental architectural change to FarmCommand. At a very basic level, the subsystems and components of FarmCommand that receive, store, parse, and analyze message data are designed for a server-based operating environment. This choice of operating environment affects nearly every aspect of the software's structure and behavior. Speaking generally, different run-time environments (server, desktop, mobile, embedded, etc.) each have their own programming models, design patterns, languages, libraries, APIs, frameworks, utilities, and so on. To give just a few examples: the way that functions are

> invoked, the control flow and threading models used in the code, the mechanisms available for memory management, and data storage and retrieval APIs all vary across these run-time environments. As a result, moving all the Vanessa functionality and a substantial portion of the Patricia functionality to the CanPlug would require more than just rewriting substantial portions of complex, interconnected code. It would also require totally rethinking the high-level design of those components and their relationships to other components in the FarmCommand system.
>
> [Emphasis added; Edwards Third Report, para 35.]

[257] These statements are not limited to differences in storage and processing capacity. Nor do they suggest that they apply only when considering moving storage and processing functions from a server to a device and are irrelevant when considering the reverse. I therefore agree with Farmers Edge that Dr. Edwards' opinion on the essentiality of location of memory and processing in Claim 1 is at odds with his earlier evidence.

[258] I am therefore not satisfied that Farmobile has met its onus to demonstrate that it would be obvious to the POSITA at the date of publication that substitution of a variant in which data storage and processing occurred off the device would make no difference to the way the invention works, *i.e.*, that it would "obviously work in the same way."

[259] Based on my review of the patent and the evidence, I conclude the POSITA would understand that the location of the storage and processing functions of Claim 1 to be an essential element of the claim, namely that the *relay device* itself must comprise the *memory storage* that stores the various sub-elements of element 1(d), and the *microprocessor* that performs the functions of element 1(e).

(3) Claim 2

[260] Claim 2 of the ’742 Patent specifies the nature of the *match* to be performed by a relay device of Claim 1. It reads as follows, with phrases discussed below underlined:

> 2. The relay device of claim 1, wherein the programming instructions in the application program cause the microprocessor to automatically determine the match between the farming implement used to perform the farming operation and the known farming implement of the implement profile by:
>
> (a) detecting in the messages an address claim message sent by the farming implement, the address claim message including a manufacturer code and a device class for the farming implement;
>
> (b) detecting in the messages an object pool version message sent by the farming implement, the object pool version message including a version for the farming implement;
>
> (c) confirming a first match between the manufacturer code and the device class in the address claim message with the known manufacturer code and the known device class in the implement profile; and
>
> (d) confirming a second match between the version in the object pool version message and the known version in the implement profile.

[261] The primary dispute between the parties with respect to Claim 2 is how the claim affects the construction of Claim 1, discussed at paragraphs [137] to [147] above. As for Claim 2 itself, the parties agree that it requires the application program to determine the *match* through a process with four steps. First, the program detects in the messages [*i.e.*, the “one or more messages transmitted on the message bus” of element 1(e)(i)] an *address claim message* including a *manufacturer code* and a *device class* for the *farming implement* [*i.e.*, the *farming implement* used to perform the *farming operation* of element 1(e)(i)]. As discussed, the parties

agree the *address claim message* is a message defined in the ISO 11783 standard as containing a NAME field, and that the *manufacturer code* and *device class* in the *address claim message* are of the nature set out in the ISO 11783 standard as part of the NAME field: Edwards Second Report, paras 75–76, 78; Ault First Report, Appendix A, p 183.

[262] Second, the program detects in the messages an *object pool version message*, which includes a *version* for the farming implement. Again, the parties agree that the *object pool version message* is a message defined in the ISO 11783 standard as part of the Get Version (or Virtual Terminal Get Version) message, and that the *version* would be the virtual terminal object pool version set out in the ISO 11783 standard: Edwards Second Report, paras 76, 78; Ault First Report, Appendix A, p 184.

[263] Third, the program confirms a *match* between the *manufacturer code* and *device class* from the *address claim message* and the *known manufacturer code* and *known device class* in the *implement profile* [*i.e.*, the *implement profile* for a *known farming implement* of element 1(d)(iii)]. Fourth, the program confirms a *match* between the *version* from the *object pool version message* and the *known version* in the implement profile.

[264] In essence, the matching step of Claim 2 involves matching the *farming implement* being used to the *known farming implement* in the *implement profile* by matching the *manufacturer code* and *device class* sent by the *farming implement* in an *address claim message* with the *manufacturer code* and *device class* stored in the *implement profile*, and matching the virtual terminal object pool version sent by the *farming implement* in an object pool version message

with the *version* stored in the implement profile. Unlike Claim 1, therefore, the *match* of Claim 2 must use all three of the *manufacturer code*, *device class*, and *version* parameters required to be in the *implement profile*.

(4) Claim 20

[265] Claim 20 is the first independent system claim, from which Claims 21 to 37 depend. It reads as follows, with terms discussed below underlined:

> 20. A farming data exchange system, comprising:
>
> (a) a microprocessor;
>
> (b) a first data store for storing a user account and an electronic farming record for a farming business;
>
> (c) a second data store for storing descriptive information about a farming operation land segment associated with the farming business;
>
> (d) a third data store for storing an implement profile defining, for a known farming implement, a known manufacturer code, a known device class, a known version and a known communication protocol;
>
> (e) a network interface configured to receive message data, position data and time data acquired by a remote relay device connected to a farming vehicle or farming implement while the farming vehicle or farming implement are used to perform a farming operation at the farming business; and
>
> (f) an application program having programming instructions that, when executed by the microprocessor, will cause the microprocessor to automatically:
>
> (i) extract content from the message data and use the extracted content to determine that there is a match between the farming implement used to perform the farming operation and the known farming implement of the implement profile,
>
> (ii) use the extracted content, the position data, the time data and the known communication protocol defined by the

> implement profile for the known farming implement to determine a set of operating events and a travel path for the farming operation, the travel path including only those areas of land on the farming operation land segment where the farming vehicle and farming implement traveled while performing the farming operation, and does not include any areas of land on the farming operation land segment where the farming vehicle and farming implement did not travel during the farming operation,
>
> (iii) use the set of operating events, the travel path and the descriptive information stored in the database to determine that the farming operation occurred on the farming operation land segment, and
>
> (iv) record the farming operation and the descriptive information for the farming operation land segment in the electronic farm record.

[266] As can be seen, the *farming data exchange system* of Claim 20 includes many of the terms and elements found in the *relay device* of Claim 1. The parties agree, as do I, that these terms would be understood in the same way in Claim 20 as they are in Claim 1. This includes the terms *microprocessor*; *electronic farming record*; *farming operation land segment*; *implement profile*; *known manufacturer code*; *known device class*; *known version*; *known communication protocol*; *relay device*; *application program*; *automatically*; *set of operating events*; and *travel path*.

[267] The parties also agree that the term *data store* used in Claim 20 is synonymous with "memory" or "database," and thus with the *memory storage area* of Claim 1: Edwards First Report, para 66; Edwards Second Report, para 47; Ault First Report, Appendix A, pp 175, 202. As a result, element 20(b) would be understood by the POSITA in the same way as element 1(d)(i) of Claim 1, with the added requirement that the *data store* must also store a user

account; element 20(c) would be understood in the same way as element 1(d)(ii); and element 20(d) would be understood in the same way as element 1(d)(iii).

[268] Element 20(e) requires the system to have a *network interface* to receive *message data* and other data acquired by a *remote relay device*. The parties agree that the term *network interface* refers to the hardware and software components of the system that connect a device to a network, that is, an access point through which the system will communicate with the *remote relay device*: Ault First Report, Appendix A, p 202; Edwards First Report, para 75.

[269] The parties also agree that the language of element 20(e) indicates to the skilled reader that the *relay device* of Claim 20 is remote from the system. In other words, Claim 20 claims a system that is configured to receive data acquired by a *relay device*, and has software that will process that data, but does not include the device itself: Edwards First Report, paras 44–45, 58, 75–78; Ault First Report, paras 58, 86, Appendix A, p 203; Ault Second Report, paras 91, 96, 133, 145; Transcript, Day 8, pp 113–114; Day 9, pp 33–34.

[270] However, the parties disagree on the meaning of the term *message data*, which appears in both elements 20(e) and 20(f)(i). Farmers Edge, relying on Mr. Ault's evidence, contends that it refers to data sent to the *relay device* by the farming equipment via the *message bus*, since this is the only data that would be *acquired by a remote relay device* when connected to farming equipment, and since element 20(f)(ii) makes clear that the *message data* must include agronomic data that is only generated by the farming equipment: Ault First Report, paras 16, 55, Appendix A, p 203; Ault Second Report, paras 7, 45, 57; Transcript, Day 8, p 106; Day 9, pp 26–

27, 33–34, 42. Farmobile, relying on Dr. Edwards' evidence, argues the term *message data* could include data other than data sent by the *farming implement*, and in particular could include data sent by the *remote relay device* itself, such as a serial number or other unique identifier assigned to the device: Edwards First Report, paras 78, 312 (p 158, as corrected); Transcript, Day 3, pp 30–32; Day 3 (CEO), pp 52–53.

[271] In my view, read in context, the term *message data* as used in Claim 20 would be understood by a POSITA to mean data in messages received by the *remote relay device* via the *message bus*. I reach this conclusion for the following reasons.

[272] The term *message data* must be read in the context of both element 20(e) and Claim 20 as a whole. Element 20(e) refers to *message data* that is "acquired by a remote relay device connected to a farming vehicle or farming implement while the farming vehicle or farming implement are used to perform a farming operation at the farming business." There are two important features of this language.

[273] First, I agree with Farmers Edge that the reference to data "*acquired by* a remote relay device" indicates that the data does not originate from the *relay device*. On this point, I view Dr. Edwards' evidence to be internally inconsistent. Dr. Edwards' First Report refers to Figure 3 of the '742 Patent and the discussion of this figure in the disclosure. Based on this figure, he suggests that the *position data* and *time data* could come from a GPS receiver embedded within a *relay device*. He then extrapolates from this example to assert that Claim 20 "encompasses a system in which some of the message data, position data, and time data originates within the

relay device" [emphasis added]: Edwards First Report, para 78. However, when addressing Mr. Ault's opinions on invalidity, Dr. Edwards recognized that the *message data* "must be acquired by a remote relay device" [emphasis added]: Edwards Second Report, paras 588, 657; see also Exhibit 31, p 55.

[274] In my view, Dr. Edwards' suggestion that *message data* can originate within the *relay device* is inconsistent with both the claim language, which requires that the data be "acquired by a remote relay device," and his own recognition that the *message data* must be acquired by the device. I also note that the discussion of Figure 3 in the disclosure that Dr. Edwards relies on makes clear that the figure shows a diagram of a *relay device* in accordance with an embodiment of the invention (such as that claimed in Claim 1), and not a *farming data exchange system* (such as that claimed in Claim 20). The discussion of GPS receivers in the disclosure's discussion of Figure 3 does not permit a construction of Claim 20 that effectively reads "message data […] acquired by a remote relay device" to include "message data […] originating from a remote relay device."

[275] Second, element 20(e) specifies that the *network interface* is configured to receive *message data* acquired by not just any *remote relay device* but one that is "connected to a farming vehicle or implement while [it is] used to perform a farming operation." As Dr. Edwards confirmed, this means the device "is connected to the internal message bus […] of a vehicle or implement and listens for messages that should be recorded and transmitted" [emphasis added]: Edwards First Report, para 77. In context, this indicates that the *message data* is data received by the *remote relay device* via the *message bus* from something else connected to the *message bus*:

Transcript, Day 9, pp 26–27. Indeed, Dr. Edwards provided no examples of where a *remote relay device* connected to farming equipment would acquire *message data* from, other than from the *message bus*. A POSITA familiar with precision agriculture and precision agriculture devices and systems would read the reference to "message data […] acquired by a remote relay device connected to [farming equipment] while [the equipment] is used to perform a farming operation" in accordance with their CGK pertaining to how data is conveyed by such equipment on a *message bus*.

[276] A POSITA undertaking a purposive construction of the term *message data* in this context would also recognize that element 20(f)(i) refers to extracting content from *the message data*. This reference to *the message data* can only be to the *message data* acquired by the *remote relay device* set out in element 20(e). The extracted content from the *message data* is then used in element 20(f) to (i) determine a *match* between the farming implement performing the farming operation and the *known farming implement* of the implement profile; and (ii) determine a set of *operating events* and a *travel path*. Each of these uses would indicate to the POSITA that the *message data* in question comes from the *message bus*.

[277] With respect to the first of these uses, described in element 20(f)(i), the application program uses extracted content to determine a *match* between the *farming implement* performing the *farming operation* (*i.e.*, that to which the device is attached), and the *known farming implement* of the *implement profile*. As in Claim 1, the only thing specified about the *implement profile* of Claim 20 is that it must define a *known manufacturer code*, a *known device class*, a *known version* and a *known communication protocol*. As discussed at length above at

paragraphs [179] to [192], and for the same reasons, the POSITA would understand the terms *manufacturer code* and the *device class* to have the meaning those terms have in the ISO 11783 standard, and would further understand that one or more of the *known manufacturer code, known device class,* or *known version* are used in the process of determining the *match*. As the POSITA would be well aware, the *manufacturer code* and *device class* are each parameters that are sent in messages on the *message bus* on effectively all modern farming equipment. This would indicate to the POSITA that the *message data* from which content is extracted to perform the *match* is data from messages sent on the *message bus*.

[278] With respect to the second of the uses for the *message data*, described in element 20(f)(ii), the *application program* uses the extracted content, together with the *known communication protocol* in the *implement profile,* to determine a set of *operating events* and a *travel path*. The parties agree that this step necessarily uses content that is extracted from *message data* sent by the *farming implement*, since the agronomic data necessary to determine the *operating events* and *travel path* must come from the equipment doing the farming. This again suggests that the *message data* is information sent on the *message bus*.

[279] As Farmobile points out, Claim 1 refers expressly to *messages generated by the farming vehicle or the farming implement* and to extracting content from one or more *messages transmitted on the message bus*, and this language does not also appear in Claim 20. Farmobile argues that the exclusion of this language means that the *message data* of Claim 20 must be broader than data generated by farming equipment and sent on the *message bus*. They argue that to read Claim 20 as requiring either the farming equipment or the *message bus* to be the source

of the data would be to inappropriately import limitations from either the disclosure or other claims into Claim 20. I agree with Farmobile that the different language used by the inventors is an indicator pointing to a construction of *message data* broader than data generated by farming equipment and sent on the *message bus*. On balance, however, I cannot accept Farmobile's argument that *message data* must be construed as broader than data acquired by the *remote relay device* from the *message bus*. In my view, the other indicators of a purposive interpretation discussed above outweigh this interpretive indicator based on comparison to Claim 1.

[280] It is relevant in this regard that the reference to *messages generated by the farming vehicle or the farming implement* in Claim 1 appears only in describing the configuration of the *message bus*: "wherein the message bus is configured to carry messages generated by the farming vehicle or the farming implement while [it is] used to perform the farming operation." The evidence of both experts is that this is how all message buses on farming equipment are configured—and indeed one of the very purposes of the message bus—making the reference to *messages generated by the farming vehicle or the farming implement* in Claim 1 largely redundant.

[281] I also note that the strength of the general interpretive principle that an inventor's use of different language indicates an intention to signify different things is attenuated in the context of the '742 Patent. I say this because, as noted above, there are multiple examples in the claims of the '742 Patent where the inventors have very clearly used different language to describe the same thing, for unexplained reasons. For example, the parties agree that the *travel path* of Claim 1 means the same thing as the *travel path* of Claims 4 and 20, despite the fact that Claims 4 and 20 use extensive additional language to define what a *travel path* is: Ault First Report, Appendix

A, pp 180–181, 186, 203–204; Edwards First Report, paras 86–87; Edwards Second Report, paras 68, 85. No party suggested that the term *travel path* must mean something different in Claim 1 because interpreting it in the same way as Claim 20 would involve importing language from Claim 20 into Claim 1.

[282] Similarly, the *memory storage area* of Claim 1 means the same thing as the *data stores* of Claim 20 and the *database* of Claim 38, despite the different language used: Edwards First Report, para 66; Edwards Second Report, para 47; Ault First Report, Appendix A, pp 202, 219. As further examples, the experts agree that the inventors used the term *farming data exchange system* in Claim 20 to signify the same thing as the different term *server system* in Claim 38; and the term *application program* in Claims 1 and 20 to signify the same thing as the different term *parameter extraction program* in Claim 38: Ault First Report, Appendix A, pp 179, 203, 218, 220; Transcript, Day 8, p 65; Edwards First Report, paras 60, 79–80, 112, 123; Transcript, Day 2, p 174 and Day 3, pp 2, 14–16, 28; Exhibit 31, pp 12, 59. The POSITA would see that the inventors were far from consistent in the language used to describe essential elements in their independent claims and recognize that they may simply have done the same with respect to *messages transmitted on the message bus* in Claim 1 and *message data* in Claim 20.

[283] Finally, it is worth noting that in reviewing the claims in the context of the patent as a whole, the inventors do not provide any examples or usage of the term *message data* in the disclosure that goes beyond data sent on the *message bus*. While Claim 20 is not restricted to examples given in the disclosure, the POSITA reviewing the disclosure would find their understanding based on the claim language to be consistent with its use in the disclosure.

(5) Claim 21

[284] Claim 21 adds limitations to Claim 20 pertaining to how the *match* is made and how the FOLS is determined. Claim 21 reads as follows:

> 21. The farming data exchange system of claim 20, wherein the operation tracking program determines the farming operation land segment for the farming operation by:
>
> (a) detecting in the message data an address claim message transmitted by the farming implement, the address claim message including a manufacturer code and a device class for the farming implement;
>
> (b) detecting in the message data an object pool version message for the farming implement, the object pool version message including a version for the farming implement;
>
> (c) determining that the manufacturer code and the device class in the address claim message matches the known manufacturer code and the known device class in the implement profile;
>
> (d) determining that the version in the object pool version message matches the known version in the implement profile;
>
> (e) parsing subsequent messages in the message data and extracting therefrom, in accordance with the known communication protocol defined by the implement profile, a set of operating parameters used by the farming implement while the farming implement is used to perform the farming operation; and
>
> (f) determining the set of operating events for the farming operation based on the set of operating parameters, the position data and the time data.

[285] As with Claim 2, most of the parties' arguments about Claim 21 pertained to how it affected the construction of the independent claim from which it depends, addressed above at paragraphs [137] to [147].

[286] I note that although the language of Claim 21 indicates that the limitations are on how the *operation tracking program* determines the FOLS, elements 21(a) to (d) clearly relate to the process of matching, and are equivalent to the limitations found in Claim 2. The parties did not argue otherwise: Edwards Second Report, paras 123–126; Ault First Report, Appendix A, pp 205–206. Further, while elements 21(c) and (d) do not refer to a *first match* and *second match*, the elements again refer to two matches being determined, another example of the inventors using different language to describe the same thing.

[287] I also note that Claim 21 refers to an *operation tracking program*. Mr. Ault considered this to be a mistaken reference to the *application program* of Claim 20, while Dr. Edwards considered it a component or subset of the *application program*: Ault First Report, Appendix A, p 205; Edwards Second Report, para 120. The distinction is immaterial.

[288] The final two elements of the claim, elements 21(e) and (f), mirror those in Claim 3, such that Claim 21 essentially imposes the same limitations on Claim 20 as both Claims 2 and 3 combined impose on Claim 1.

(6) Claim 38

[289] Claim 38 is the third and final independent claim in the ’742 Patent, from which Claims 39 to 44 depend. It reads as follows:

> 38. A server system for collecting and processing farming operation data for a farming business, the server system comprising:
>
> (a) a database configured to store a user account and an electronic farming record for the farming business, the

> electronic farming record including entries representing farming operations performed at the farming business and descriptions of farming operation land segments for said farming operations;
>
> (b) an implement profile for a known farming implement on the server system, the implement profile defining a known manufacturer code, a known device class, a known version and a known communication protocol for the known farming implement;
>
> (c) a farm traffic controller configured to receive and store in the database messages produced by a remote relay device associated with the user account, the messages comprising geo-location data, time data and electronic control unit messages generated by a farming implement while said farming implement is used at the farming business to perform a new farming operation; and
>
> (d) a parameter extraction program that:
>
> (i) determines a farming operation land segment for the farming operation based on the implement profile, the geo-location data, the time data and electronic control unit messages, and
>
> (ii) creates a new entry in the electronic farming record for the farming business, the new entry including an identifier for the farming operation and a description of the farming operation land segment for the farming operation.

[290] Again, the *server system* of Claim 38 includes many of the terms and elements found in the *relay device* of Claim 1 and the *farming data exchange system* of Claim 20. The parties agree, as do I, that these terms would be understood in the same way in Claim 38 as they are in Claims 1 and 20. This includes the terms *electronic farming record*; *farming operation land segment*; *implement profile*; *known manufacturer code*; *known device class*; *known version*; *known communication protocol*; and *remote relay device*.

[291] In addition, as noted above, the POSITA would recognize that: (a) although Claim 38 does not require the system to have a *microprocessor*, any server system would necessarily have one: Edwards First Report, para 48; Edwards Second Report, para 44; (b) the *server system* of Claim 38 is a *farming data exchange system*: Edwards First Report, para 112; Ault First Report, Appendix A, p 218; and (c) the *database* of Claim 38 is effectively the same as the *memory storage area* of Claim 1 and the *data stores* of Claim 20: Edwards First Report, para 66; Edwards Second Report, para 47; Ault First Report, Appendix A, pp 202, 219.

[292] Element 38(c) requires the system to have a *farm traffic controller*. This would be understood essentially as a component having the functionalities described in the remainder of element 38(c): Ault First Report, Appendix A, p 219; Edwards First Report, para 118. The *farm traffic controller* must be configured to receive and store *messages* produced by a *remote relay device*. The *messages* of element 38(c) are defined as comprising geo-location data, time data, and *electronic control unit messages* generated by a *farming implement* while it is being used to perform a new *farming operation*. *Electronic control unit messages* are messages sent over the *message bus* by the ECU on the *farming implement*: Ault First Report, Appendix A, p 220; Edwards First Report, paras 73, 119. As a result, although element 38(c) indicates that the *messages* are "produced by" the *remote relay device*, the messages clearly include information coming from other sources, including in particular the *farming implement*.

[293] The *parameter extraction program* of element 38(d) is a software program that performs the functions set out in elements 38(d)(i) and (ii) using information extracted from the *messages*: Edwards First Report, para 123; Ault First Report, Appendix A, p 220. In particular, it

determines a FOLS for the farming information "based on" the *implement profile*, the geo-location and time data, and the ECU messages, and then creates a new entry in the EFR with an identifier for the *farming operation* and a description of the FOLS for the *farming operation*.

[294] Claim 38 does not specify how the *parameter extraction program* determines a FOLS "based on" the *implement profile*. However, the POSITA would understand that the system must use the *known communication protocol* information in the *implement profile* to understand the ECU messages sent by the *farming implement*, and then use this information with the location and time data to determine the FOLS: Edwards First Report, paras 124–125; Ault First Report, Appendix A, p 220; Transcript, Day 3, p 35.

[295] Of course, for the *known communication protocol* to be useful in understanding the ECU messages, *i.e.*, for the system to be able to make sense of the messages, it must be the same as that of *farming implement* performing the *farming operation*. As a result, while Claim 38 does not include a requirement that the *server system* conduct a *match* between the *farming implement* conducting the farming operation and the *known farming implement* whose information is contained in the *implement profile*, it must somehow use the information in the *implement profile* and the *known communication protocol* to extract the farming data: Edwards Second Report, paras 601–603; Transcript, Day 3, p 35.

[296] Again, the POSITA would recognize that the inventors must have intended the presence in the *implement profile* of the *known manufacturer code*, the *known device class*, and the *known version* to have a purpose. The only such purpose identified in Claim 38 is that in element

38(d)(i), namely to determine the FOLS "based on" the *implement profile*. For the reasons given above, I conclude that this element of Claim 38 requires the *parameter extraction program* to use at least one of the *known manufacturer code*, the *known device class*, and the *known version* to make the connection between the *known communication protocol* of the *known farming implement* and the *farming implement* that is generating the ECU messages.

[297] Unlike the device of Claim 1 and the system of Claim 20, the system of Claim 38 does not require there to be a stored FOLS against which the information from the *farming operation* is compared: Ault First Report, Appendix A, p 220. Rather, it has a database that is configured to store an EFR that includes descriptions of FOLS; it uses the information received to determine a FOLS for the farming operation; and it stores a description of the FOLS in the EFR.

(7) Other dependent claims

[298] The remaining dependent claims of the '742 Patent raise no material issues regarding construction, and in particular no issues that affect the parties' arguments on infringement or validity. A brief summary of the limitations of these claims follows.

(a) *Dependent device claims (depending from Claim 1)*

[299] Claim 3 adds a limitation to the *relay device* of Claim 1 whereby the *operating events* are determined by (a) monitoring messages on the *message bus* and using the *known communication protocol* to identify *operating parameters* used by the *farming implement*, and (b) using the

operating events and position and time signals to determine the *set of operating events*. As noted above, these limitations are equivalent to those found in elements (e) and (f) of Claim 21.

[300] Claims 4 and 19 add limitations to the relay device of Claim 1 that (a) at least one operating event in the set requires the *farming implement* (Claim 4) or a *row unit on the farming implement* (Claim 19) to be in a deactivated state for at least part of the *farming operation*; (b) the program determines the *travel path* based on the deactivated state and the position and time signals; and (c) the *travel path* includes only the areas of land where the *farming vehicle* and *farming implement* traveled while the *farming implement* (or row unit) was not deactivated, and not those areas where the *farming implement* did not travel or where it was deactivated. As set out above, the POSITA would understand that the concept of a *travel path* in the '742 Patent, including as set out in Claim 1, is that the *travel path* includes only land where the farming equipment traveled while activated, and not where it did not travel or was deactivated, such that the language in elements 4(c) and 19(c) simply set out expressly the definition of a *travel path* that the POSITA would already understand from their reading of the '742 Patent.

[301] Claims 5 to 8 add limitations to the *relay device* of Claim 1 requiring the *implement profile* to define a known set of either *operating events* (Claims 5 and 7) or *operating parameters* (Claims 6 and 8) for a known set of either virtual terminal object IDs (Claims 5 and 6) or task controller messages (Claims 7 and 8), with the farming vehicle, farming implement, or task controller transmitting messages over the message bus using the known set.

[302] Claim 9 adds a limitation to the relay device of Claim 1 that the descriptive information for the *farming operation land segment* comprise one or more of 18 possible pieces of information, such as latitude, longitude, elevation, ownership status, field number, or corresponding CLU.

[303] Claim 10 adds a limitation to the relay device of Claim 1 where the memory storage area stores an *operation type* for the farming operation, and the program uses the operating events to determine that the farming operation matches the operation type, revising the electronic farm record accordingly. Claim 11 then limits the operation type of Claim 10 to plowing, tilling, fertilizing, planting, spraying, spreading, or harvesting.

[304] Claim 12 adds to the relay device of Claim 1 a *data presentation module* that prepares at least a portion of the *electronic farm record* for display on a display device, together with an input-output subsystem to transmit the portion to be displayed.

[305] Claim 13 adds to the relay device of Claim 1 a *data communications channel* for communicating with a *farming data exchange system*, and an *exchange interface module* allowing the device to transmit at least a portion of the *electronic farm record* to the farming data exchange system via the *data communications link*.

[306] Claims 14 to 16 describe the relationship between the *farming operation land segment* and the boundaries of a CLU, requiring that the FOLS correspond with the boundaries of a CLU

(Claim 14), not correspond with the boundaries of a CLU (Claim 15), or span the boundaries of two or more CLUs (Claim 16).

[307] Claim 17 requires the computer program to modify the electronic farming record to include a *travel path description* for the farming operation, while Claim 18 then adds the requirement that the travel path description include one or more of the same 18 possible pieces of information recited in Claim 9.

(b) *Dependent farming data exchange system claims (depending from Claim 20)*

[308] Claims 22 to 36 add limitations to the *farming data exchange system* of Claim 20 that are similar to those found in Claims 4 to 12 and 14 to 18, with some variations in claim order and language. Claim 37 adds to the system a report-generating program that prepares and transmits custom farm data reports.

(c) *Dependent server system claims (depending from Claim 38)*

[309] Claims 39 and 42 add limitations to the *server system* of Claim 38 pertaining to formatting of data for display on web-enabled devices.

[310] Claim 40 adds limitations to the *server system* equivalent to those in Claims 2 and 3 (and 21). Claims 41, 43, and 44 add limitations to the *server system* equivalent to those in Claims 4, 10, and 11, respectively.

IV. Infringement

A. *Principles*

[311] A patent is infringed if any valid claim is infringed. Infringement of a claim occurs when, and only when, all of the essential elements of the claim as purposively construed are present: *Free World Trust* at paras 31(f), 68(4), 75; *Western Oilfield Equipment Rentals Ltd v M-I LLC*, 2021 FCA 24 at paras 48–49. In particular, the device claims of the ’742 Patent will be infringed if Farmers Edge makes, constructs, uses, or sells a device that “takes all of the essential elements of the invention”: *Free World Trust* at para 68(4); *Patent Act*, s 42. Similarly, the system claims of the ’742 Patent will be infringed if Farmers Edge makes, constructs, uses, or sells a system that comprises all of the essential elements of those claims: *Western Oilfield* at para 49.

[312] In determining whether a patent has been “used,” the Court may ask whether the defendant’s activity deprived the inventor of full enjoyment of the monopoly conferred by law: *Monsanto Canada Inc v Schmeiser*, 2004 SCC 34 at para 35. This inquiry is itself related to the requirement that the alleged infringer take all of the essential elements of the claim: *Janssen Inc v Apotex Inc*, 2019 FC 1355 at para 229, aff’d 2021 FCA 45; *Cobalt* at paras 39–40.

[313] In some cases, mere possession of an item may constitute “use” of the invention, where the invention has what is termed a “stand-by utility,” such as in the case of a fire extinguisher, a spare steam engine, or a shipboard pump: *Monsanto* at paras 47–48, 51. Exploitation of that stand-by utility constitutes use of the invention: *Monsanto* at para 47.

[314] A defendant's intention is generally irrelevant to a finding of infringement. It is what the defendant does, and not what they intend, that determines whether a patent is infringed: *Monsanto* at para 49. However, intention or presumed intention may be relevant in the context of stand-by utility, as it is the intention to use the invention should the need arise that constitutes use: *Monsanto* at paras 50–58.

B. *The CanPlug and FarmCommand*

[315] Farmobile alleges Farmers Edge infringes the '742 Patent through its CanPlug and FarmCommand products. The CanPlug is a small electronic device designed to facilitate collection and transmission of data from agricultural equipment. It can be physically connected to the message bus on farming equipment through a connection port that is defined in the SAE J1939 and ISO 11783 standards and found on effectively all modern farming equipment. The CanPlug is advertised as being "brand independent," in that it can relay information from agricultural equipment from various manufacturers. The CanPlug includes a microprocessor that runs software, computer memory, a GPS unit, a cellular modem, and a Bluetooth transceiver.

[316] FarmCommand is a farm management information software system used to manage and analyze data to evaluate and plan farming operations, generate maps and reports, track equipment, and improve decision-making. FarmCommand is a cloud-based service. Users can access their FarmCommand account and use FarmCommand functionalities through a website or a mobile app. The CanPlug is designed to be used as part of FarmCommand, with the FarmCommand system allowing the user to access data collected via the CanPlug.

[317] FarmCommand allows users to analyze the agronomic and other data generated during farming operations in a variety of ways. This includes through the generation of maps showing, for example, harvest yields or soil nitrogen levels at different locations on a field. Some of these functions, including the preparation of harvest maps, can be performed using the FarmCommand software through website access, or through the "In-Cab Tool" on the FarmCommand mobile app [In-Cab App], which allows users to access data from their mobile device in real time while in the cab of their farming equipment.

[318] Farmers Edge updates the FarmCommand software, including the software on the CanPlug, from time to time. Material to this litigation in particular are the April 2021, July 2021, February 2022, and April 2022 Updates, which Farmers Edge implemented in response to Farmobile's allegations, in an effort to ensure it was not infringing the '742 Patent. For the purposes of assessing infringement, four periods are of particular importance: pre-April 2021; from April 2021 to July 2021; from July 2021 to April 2022; and post-April 2022.

C. *Pre-April 2021*

[319] Prior to the April 2021 Update, Farmobile alleges FarmCommand infringed the Asserted System Claims, namely independent Claim 20 and nine of its dependent claims (26–27 and 31–37), and independent Claim 38 and five of its dependent claims (39 and 41–44).

(1) Claim 20

[320] There is no dispute that FarmCommand is a *farming data exchange system*, comprising (a) a *microprocessor*; (b) a *data store* for storing a user account and an *electronic farming record* for a *farming business*; (c) a *data store* for storing descriptive information about a FOLS; (e) a *network interface* configured to receive *message data* and other data from a *remote relay device* connected to a *farming vehicle* or *farming implement*; and (f) an *application program* having programming instructions that, when executed by the *microprocessor*, will cause it to take certain steps. The dispute between the parties lies in whether, prior to April 2021, FarmCommand comprised a *data store* for storing an *implement profile* as set out in element 20(d), and whether the *application program* caused the *microprocessor* to *automatically* take the steps set out in element 20(f), including the *match* of element 20(f)(i).

[321] Dr. Edwards undertook an in-depth review of the FarmCommand source code using analytical methods known as software architecture recovery analysis and static program analysis. This review led him to the conclusion that FarmCommand stores an *implement profile* for every *farming implement* known to be associated with or used by a *farming business*: Edwards First Report, para 187. According to Dr. Edwards, the attributes associated with the *implement profiles* in FarmCommand include (1) the manufacturer of the implement, (2) the type of the implement, (3) the model of the implement, and (4) the message types and formats used by the implement. He correlated these attributes with the *known manufacturer code*, *known device class*, *known version*, and *known communication protocol* of elements 20(d) and 38(b): Edwards First Report, paras 187–189, 262.

[322] However, Dr. Edwards' analysis and conclusions with respect to the *known manufacturer code* and *known device class* were based on his construction of those terms. As set out above at paragraphs [111] to [163] and [266], I have not accepted that construction. Rather, I have concluded the POSITA would understand the *manufacturer code* and *device class* contained in the *implement profile* of Claim 20(d) to be the manufacturer code and device class defined as part of the NAME field in ISO 11783.

[323] The information stored in FarmCommand's databases regarding the implement's manufacturer includes the name of the manufacturer. As Farmobile concedes, the information does not include the "manufacturer code" described and defined in ISO 11783. Similarly, the information regarding the type of implement includes the name of the implement, such as "tractor" or "harvester," but not the "device class" described and defined in ISO 11783: Ault Second Report, paras 5, 36–42; Transcript, Day 4, p 78; Day 12, p 89.

[324] I therefore conclude that Farmobile has not established that FarmCommand comprised or comprises a *third data store* for storing an *implement profile* defining, for a *known farming implement*, either a *known manufacturer code* or a *known device class*, as those terms are used in Claim 20(d).

[325] In addition, element 20(f)(i) requires the *application program* to use extracted content from the *message data* to determine there is a *match* between the *farming implement* being used and the *known farming implement* of the *implement profile*. I have concluded that the POSITA would understand (a) the *message data* to mean data in messages received by the *remote relay*

device via the *message bus* (see paras [270] to [283] above); and (b) the *match* to involve one or more of the items that must be contained in the *implement profile*, namely the *known manufacturer code*, *known device class*, or *known version* (see paras [179] to [192] and [277] above). Farmobile does not contend that a *known manufacturer code* or a *known device class* as those terms are construed above are used in the *match*; nor does it contend that a *known version* in the *implement profile* is used in the *match*. Rather, Farmobile's arguments regarding infringement of this element by the FarmCommand system relate to the use of the PGN, source address, and opcode, and/or the CanPlug ID (a unique identifier assigned to a CanPlug unit) in the *match*: Farmobile Closing Submissions, paras 49, 59, 127–129.

[326] The PGN, source address, and opcode are received by the CanPlug over the *message bus*. However, none of them is or is comparable to a *manufacturer code*, *device class*, or *version* contained in the *implement profile*, even on Farmobile's construction. The CanPlug ID is resident on the CanPlug and is not *message data* acquired by the CanPlug via the *message bus*. I therefore conclude that to the extent that FarmCommand undertakes a *match* between the *farming implement* being used and the *known farming implement* of the *implement profile*, it does not do so using content extracted from *message data* using any of the identified data in the *implement profile*, and therefore does not satisfy element 20(f)(i).

[327] As the FarmCommand system prior to April 2021 did not contain all of the essential elements of Claim 20, it did not infringe that claim or any of its dependent claims.

[328] It is therefore unnecessary to assess any of the other contested issues going to infringement, including whether the PGN database in FarmCommand defines, for a *known farming implement*, a *known communication protocol* or whether the manner in which FarmCommand parsed messages using that PGN database involved conducting a *match* within the requirements of Claim 20.

(2) Claim 38

[329] There is no dispute that FarmCommand is a *server system* for collecting and processing *farming operation* data for a *farming business*, comprising (a) a *database* configured to store a user account and an *electronic farming record* for a *farming business*; (c) a *farm traffic controller* configured to receive and store messages produced by a *remote relay device*, including geo-location data, time data and ECU messages generated by a *farming implement*; and (d) a *parameter extraction program*. Again, the dispute between the parties lies in whether, prior to April 2021, FarmCommand comprised an *implement profile* as set out in element 38(b), and in particular whether the *implement profile* defines a *known manufacturer code*, a *known device class*, and a *known version* for a *known farming implement*. There is also a dispute as to whether the *parameter extraction program* of FarmCommand determined the FOLS for the *farming operation* based on the *implement profile* and other data, as set out in element 38(d)(i).

[330] For the same reasons above in respect of Claim 20, and as conceded by Farmobile, given my conclusions on the construction of the terms *manufacturer code* and *device class*, the FarmCommand system prior to April 21, 2021, did not comprise an *implement profile* defining a *known manufacturer code* and a *known device class* for a *known farming implement*.

[331] As noted above, Claim 38 does not include a requirement that the *server system* conduct a *match* between the *farming implement* doing the farming and the *known farming implement* of the *implement profile*. However, element 38(d)(i) requires that the program determine a FOLS "based on," among other things, the *implement profile* and the ECU messages sent by the *farming implement*. The POSITA would understand that the system must use at least one of the parameters required to be in the *implement profile* to make the connection between the *known communication protocol* and the *farming implement* that is generating ECU messages: see paras [293] to [296] above. For the reasons set out above in respect of Claim 20, Farmobile's arguments in respect of this element, which are based on the PGN, source address, opcodes, and CanPlug ID, do not meet the requirements of element 38(d)(i): Farmobile Closing Submissions, paras 67, 125, 129.

[332] As the FarmCommand system prior to April 2021 did not contain all of the essential elements of Claim 38, it did not infringe that claim or any dependent claims. It is therefore unnecessary to assess any of the other contested issues going to infringement of this claim.

[333] Based on the foregoing, I conclude that Farmobile has not established that the FarmCommand system infringed any of the Asserted System Claims prior to April 2021.

D. *April 2021 to July 2021*

[334] In April 2021, Farmers Edge implemented a software update of the FarmCommand and CanPlug system. That update relocated to the CanPlug the message data processing function previously performed by a component of FarmCommand known as "Vanessa." Dr. Edwards had

identified Vanessa as the component responsible for parsing data received from the CanPlug, including in particular performing the steps of *matching* the *farming implement* and extracting data: Edwards First Report, paras 171, 176, 190–191, 194, 197–202.

[335] The CanPlug software has a function called "pgn2ble" which processes message data. This was previously used to send parsed data to the In-Cab App, while unparsed "raw" message data was sent to FarmCommand, where it was parsed by Vanessa. As a result of the April 2021 Update, the CanPlug would not send unparsed message data to FarmCommand, and FarmCommand would not parse or extract data from such message data. Rather, the CanPlug would send to FarmCommand the message data that had already been parsed by pgn2ble. Mr. Ault gave the opinion that FarmCommand would not fall within Claims 20 or 38 since it would not extract content from *message data* received from a *remote relay device*, or use any such extracted content to perform the steps in element 20(f), and would not receive *messages* produced by a *remote relay device* that comprise *electronic control unit messages* as required by element 38(c): Ault Second Report, paras 132–140; Ault Fourth Report, paras 5–7.

[336] Farmobile accepts that FarmCommand does not infringe the Asserted System Claims after the April 2021 Update, subject to arguments about implementation and stand-by utility. However, it argues that after the April 2021 Update, the CanPlug infringes the Asserted Device Claims, namely Claim 1 and seven claims that depend from it (Claims 3, 4, 9, 13, 17, 18, and 19).

[337] I will address Farmobile's arguments regarding the implementation of the software update and the question of stand-by utility, before turning to the issue of whether the CanPlug infringed the Asserted Device Claims in this period.

(1) Evidence of the roll-out of the software update

[338] The affidavit filed by Mr. Young, Senior Embedded Team Lead at Farmers Edge, states that he or members of his team authored the code associated with the April 2021 update: Exhibit 116. He attached video recordings of a Microsoft Teams meeting during which a demonstration of the April 2021 update process was shown, and provided screenshots of the process. As a result of this process, CanPlug models that connect to the FarmCommand server by cellular communication would automatically download the software update and install it on their next startup. Some CanPlug devices do not connect by cellular communication (these are used in Brazil, where farms are often located outside cellular network range); these devices had to be updated manually by technicians travelling to the farm and physically connecting to the CanPlug.

[339] Mr. Young testified that the Vanessa component of the FarmCommand server software cannot operate with CanPlugs updated with the April 2021 Update, since the CanPlug sends data in a format Vanessa cannot use. His affidavit refers to a "Device Manager" functionality within the FarmCommand software, which lists CanPlugs assigned to farmers, indicates what software version they are using, and can be used to set the desired software version. Using data extracted from the Device Manager, Mr. Young provided data as of July 18, 2022, regarding (a) the percentage of CanPlugs of different models that had been updated to the April 2021 Update

software (and later updates); and (b) whether and when the cellular-capable CanPlugs that had not been updated had contacted the FarmCommand server.

[340] Farmobile criticizes Mr. Young's evidence on two grounds. First, it says Mr. Young was only personally present for the demonstration update of certain CanPlugs, and that he did not personally witness the update of others, which were performed by another Farmers Edge employee. It therefore contends that Mr. Young's evidence with respect to the update of other CanPlug devices is hearsay. Second, it says Mr. Young did not provide the requisite information to suggest that the Device Manager constitutes a business record of Farmers Edge. These criticisms are wholly unpersuasive. I am satisfied that by virtue of Mr. Young's role as Senior Embedded Team Lead, his awareness of the software updates conducted by Farmers Edge, and his personal steps taken to review both the update process and reports taken from functionalities in the FarmCommand software that he was familiar with and that are described in his affidavit, Mr. Young was in a position to testify as to the contents of his affidavit even if he did not personally undertake each software update: *Coldwater First Nation v Canada (Attorney General)*, 2019 FCA 292 at paras 42–46.

[341] I therefore accept Mr. Young's evidence on the extent to which the April 2021 Update was implemented. In particular, I am satisfied that, with few exceptions, cellular CanPlugs (those outside Brazil) were updated if and when they contacted the FarmCommand server for a sufficient period of time to update. Some CanPlugs had not contacted the FarmCommand server, either between April 2021 and July 2022, or ever. A small number contacted the FarmCommand

server but were not updated, likely due to a short period of contact, poor cell coverage, or something else interfering with the update.

[342] Nonetheless, after the April 2021 Update, the FarmCommand software continued to include the Vanessa component, which allowed it to process data from CanPlugs that had not yet been updated. The system of Claim 20 need only be "configured" to receive data acquired by a remote *relay device* and have an *application program* with software that, when executed, performed the functions of element 20(f). Claim 20 does not require the *relay device* to actually send any data. To the extent that FarmCommand had the essential elements of Claim 20 before April 2021, it would have continued to have them after April 2021, regardless of whether any data was actually being sent.

[343] Thus, had I found the FarmCommand system to infringe the Asserted System Claims prior to the April 2021 Update, which I have not, then there would have been some degree of ongoing infringement after April 2021. At the same time, the extent to which the pre-April 2021 system was operative and being used may very well have been relevant to remedies issues.

(2) Stand-by utility

[344] Farmobile argues that after April 2021, and also after later software updates, Farmers Edge still maintained the Vanessa component in the FarmCommand system, and that it maintains an archived copy of the component to this day. It argues that there continues to be infringement under the "stand-by utility" doctrine discussed in *Monsanto*. It refers to Mr. Young's evidence to the effect that re-introducing the former versions of the software would

be possible and as easy as the introduction of the April 2021 Update was. I will address the stand-by utility argument here, although it applies in respect of all updates.

[345] As noted, the continued existence of the Vanessa component as part of the executed and executable software in FarmCommand that could parse any parsable data that may come in would have been sufficient for a finding of infringement. However, if code cannot be executed by the microprocessor, whether as a result of having been deleted, archived, or commented out, the application program no longer has such programming instructions. Farmobile has not satisfied me that the continued existence of non-executed older versions of the FarmCommand code has any stand-by utility.

[346] The notion of stand-by utility is that possession of an item may amount to "use" where the very value of possessing the item is to have it available in the event of necessity. The examples commonly given are a fire extinguisher, or a spare engine. Possession of a patented fire extinguisher may constitute "use" of it, even if it is never discharged to put out a fire, since its value lies in having it on stand-by to be used should the need arise: *Monsanto* at paras 47–48, 51. This does not mean, however, that possession of every unused item constitutes infringement by use based on stand-by utility since it could, theoretically, be used some day.

[347] Farmobile has not satisfied me that there is any stand-by utility in Farmers Edge's possession of deleted or archived copies of the Vanessa component. For the period that Vanessa was part of the FarmCommand system, *e.g.*, for CanPlugs that had not been updated, the programming instructions were in use and the concept of stand-by utility has no application.

However, as indicated, the extent to which Vanessa was used might have been relevant to remedy issues. In this regard, for CanPlugs that have been updated, and therefore cannot send data in a form usable by Vanessa, I have not been persuaded there is any stand-by utility in the possibility that someday Farmers Edge could again re-program the CanPlugs.

[348] While Mr. Young indicated it was possible earlier software versions could be redeployed, there was no evidence that Farmers Edge had or has any intention of doing so, or that there would be any benefit or value in doing this, or any benefit or value to the actual system in place in having the old code in an archive somewhere. This is particularly so given the asserted improvement in the new architecture: Ault Fourth Report, para 7; Ault Fifth Report, para 100.

[349] I therefore reject Farmobile's arguments that Farmers Edge infringed or is infringing the '742 Patent based on an asserted stand-by utility.

(3) Claim 1

[350] The Asserted Device Claims all depend from Claim 1. With reference to that claim, there is no dispute between the parties that the CanPlug is a *relay device* for tracking *farming operations* for a *farming business*, comprising (a) a *microprocessor*; (b) a *bus connector* for connecting device to a *message bus* on a *farming vehicle* or *farming implement*; (c) a GPS receiver; (d) a *memory storage area*; and (e) an *application program* comprising programming instructions that cause the *microprocessor* to take certain steps. The dispute between the parties lies in whether, after April 21, 2021, the *memory storage area* of the CanPlug stored the data set

out in element 1(d) of Claim 1; and whether the *application program* caused the *microprocessor* to *automatically* take the steps set out in element 1(e).

[351] As with the Asserted System Claims, Dr. Edwards' opinion that the CanPlug infringed the Asserted Device Claims is based on his views regarding the construction of the terms *manufacturer code* and *device class*: Edwards Fifth Report, paras 65–76; Transcript, Day 3 (CEO), pp 57–59. Farmobile concedes that on the construction I have given those terms above, the CanPlug does not infringe the Asserted Device Claims. No evidence was presented that the CanPlug comprises a *memory storage area* that stores an *implement profile* defining, for a known *farming implement*, a *known manufacturer code* or a *known device class* as I have construed those terms: Ault Fifth Report, paras 24–27.

[352] In addition, element 1(e)(i) requires the *application program* to use extracted content from the *messages* transmitted on the *message bus* to determine there is a *match* between the *farming implement* being used and the *known farming implement* of the *implement profile*. Farmobile argues that the PGN, source address and opcode parameters, which are extracted from *messages* transmitted on the *message bus*, are used in conducting the *match*: Edwards Fifth Report, paras 78–87; Farmobile Closing Submissions, paras 145–146.

[353] I have concluded the POSITA would understand the *match* of element 1(e)(i) to involve one or more of the items that must be contained in the *implement profile*, namely the *known manufacturer code*, *known device class*, or *known version* (see paras [179] to [192] above). Farmobile does not contend that a *known manufacturer code* or a *known device class* as those

terms are construed above is used in the *match*; nor does it contend that a *known version* in the *implement profile* is used in the *match*: Ault Sixth Report, paras 79–80. Indeed, none of the PGN, source address, or opcode is a *manufacturer code*, *device class*, or *version* contained in the *implement profile*, even on Farmobile's construction of those terms. I therefore conclude that to the extent that the CanPlug undertakes a *match* between the *farming implement* being used and the *known farming implement* of the *implement profile*, it does not do so using content extracted from *messages* transmitted on the *message bus* using any of the identified data in the *implement profile*, and therefore does not satisfy element 1(e)(i).

[354] As the CanPlug after the April 2021 Update did not contain all of the essential elements of Claim 1, it did not infringe that claim or any of its dependent claims. It is therefore unnecessary to assess any of the other contested issues going to infringement of this claim, including whether the CanPlug itself determines a set of *operating events* or a *travel path* as required by element 1(e)(ii), or simply a series of *operating parameters*, a matter of dispute between Dr. Edwards and Mr. Ault: Edwards Fifth Report, paras 88–94; Ault Fifth Report, paras 65–88; Edwards Sixth Report, paras 50–60; Ault Sixth Report, paras 101–111.

E. *July 2021 to April 2022*

[355] Farmers Edge received Dr. Edwards' Fifth Report in July 2021. As discussed above, that report opined that after the April 2021 Update, the CanPlug infringed the Asserted Device Claims. While Farmers Edge maintained that the CanPlug did not infringe the Asserted Device Claims, it further updated the CanPlug software in July 2021 to implement an alternative architecture that Mr. Ault had stated would not infringe the Asserted Device Claims even on

Dr. Edwards' opinion. In particular, aspects of the CanPlug software that Dr. Edwards had identified as performing the requirements of element 1(e)(iii)—using the set of *operating events*, the *travel path* and the descriptive information stored in the *memory storage area* to determine that the *farming operation* occurred on the *farming operation land segment*—were removed from the CanPlug: Ault Fifth Report, paras 110–112, 120–121.

[356] For the reasons given above, and despite Farmobile's arguments regarding Mr. Young's evidence, I accept that these changes were released in July 2021 and that CanPlugs using cellular networks automatically received the update when they accessed the FarmCommand server for a sufficient period of time to receive the update: Exhibit 116. Mr. Young's evidence establishes that in the year following the release, most CanPlugs had been updated, with considerably higher update rates among CanPlugs using cellular networks than those in Brazil requiring manual updates. Among the cellular CanPlugs that had not been updated, most had never contacted the FarmCommand server (and thus had not received the April 2021 Update either), or had not contacted the server since April 2021.

[357] Dr. Edwards reviewed the July 2021 Update and concluded that CanPlugs that had received the update continued to infringe the Asserted Device Claims, save for Claim 9. He found that the functionality of elements 1(d)(ii), 1(e)(iii), and 1(e)(iv) were no longer being performed on the CanPlug. However, he concluded that these elements were being performed on a server processor and, as discussed above commencing at paragraph [215], opined that it was not an essential element of Claim 1 that these functions be performed on the *relay device*: Edwards Sixth Report, paras 6, 71–124.

[358] I have set out above at paragraphs [235] to [259] my reasons for rejecting Farmobile's arguments and Dr. Edwards' opinions on the issue of essentiality. Farmobile concedes, based on Dr. Edwards' evidence, that the CanPlugs that have been updated with the July 2021 Update do not themselves contain a *memory storage area* of element 1(d)(ii) or an *application program* of element 1(e)(iii) or 1(e)(iv). I conclude that such CanPlugs are not a *relay device* that comprises these elements, and that they therefore do not infringe Claim 1 for this reason, in addition to the reasons given above.

[359] For the reasons given above, I also reject Farmobile's arguments in respect of infringement based on stand-by utility in respect of this time period.

[360] Dr. Edwards reviewed a further version of the CanPlug software from February 2022. He found no differences in the February 2022 Update that are material to the infringement analysis: Edwards Sixth Report, paras 3, 11, 142–148. The July 2021 and February 2022 Updates are thus effectively the same for the issues in this proceeding, and the foregoing discussion applies to the period from July 2021 onward. I note that Farmobile's arguments and allegations regarding the Asserted Device Claims are only made in respect of CanPlugs that received either the April 2021 Update, the July 2021 update, or both (*i.e.*, not CanPlugs that have a pre-April 2021 version of the CanPlug software).

F. *Post-April 2022*

[361] The final change to the FarmCommand software referred to in the evidence was made in April 2022. In his Sixth Report, Mr. Ault states he was provided with screenshots and

descriptions from Farmers Edge's Kubernetes environment (a system for automating deployment and management of applications) and its GitHub account (a code repository) showing that the Vanessa component of FarmCommand had been deleted: Ault Sixth Report, paras 114–116. Mr. Ault also states that he had reviewed a current version of the server code, which shows that all "dldata files" (the format in which non-updated CanPlugs send unparsed message files) received by the FarmCommand server are being automatically deleted: Ault Sixth Report, paras 117–120, Schedule 9.

[362] Farmers Edge asserts that as a result of the foregoing changes, the FarmCommand system can no longer infringe any of the Asserted System Claims of the '742 Patent, even in the context of CanPlugs that have not been updated and even based on Farmobile's constructions of the claims, since the Vanessa component that Dr. Edwards asserted performed the functions in element 20(f)(ii) [and 38(d)(i)] is no longer present.

[363] Farmobile argues that the evidence before the Court does not establish that Vanessa has been deleted from FarmCommand. In particular, it contends that the screenshots in Mr. Ault's evidence are insufficient to demonstrate the deletion, and that Dr. Edwards was not provided with the ability to inspect Farmers Edge's Kubernetes environment, its audit logs, all of its code repositories, and documentation to establish what source code was used to create the images, which he said he would need in order to verify whether Vanessa had been entirely deleted and removed from Farmers Edge's systems: Edwards Seventh Report, paras 37–38; Transcript, Day 3 (CEO), pp 55–57.

[364] Although I agree with Farmobile that there are flaws in the evidence with respect to the April 2022 Update, I am satisfied on the balance of probabilities based on the evidence before the Court that Vanessa is no longer part of FarmCommand and that dldata files received by FarmCommand are automatically deleted.

[365] In particular, I agree with Farmobile that the screenshots in Mr. Ault's Sixth Report are insufficient to establish, on their own, that Vanessa was deleted in the April 2022 Update. Mr. Ault states that he was "provided with" the screenshots and the descriptions, but his report does not indicate who provided the screenshots or the descriptions: Ault Sixth Report, para 115. Indeed, Mr. Ault states that counsel to Farmers Edge advised when the screenshots were taken and that all of Farmers Edge's functional and operating code is contained in the Kubernetes production environment. The source of counsel's information is not stated.

[366] However, the foregoing must be considered in combination with other evidence on the record. This includes Mr. Ault's statement that he attended on a conference call with representatives of Farmers Edge, including Mr. Young, in which Farmers Edge demonstrated that they had deleted Vanessa: Transcript, Day 9 (CEO), pp 2–3. In addition, although Mr. Young did not testify in chief about the April 2022 Update, he gave evidence in cross-examination that "as of right now Vanessa is not active anymore," and that to return to the system in place in March 2021, Vanessa would have to be "put back": Transcript, Day 10, p 31. Further, while Dr. Edwards stated that he had not been provided with all of the information that he believed would be necessary to verify that Vanessa had been deleted, he indicated that he had been provided with a code production in April 2022 that did not include Vanessa: Transcript,

Day 3 (CEO), p 57. Conversely, there is no positive evidence that Vanessa continues to be contained in FarmCommand. I therefore conclude on a balance of probabilities that Vanessa was deleted from the server software of FarmCommand in April 2022.

[367] In addition to the deletion of Vanessa, Mr. Ault's Sixth Report attaches an April 2022 copy of the component of FarmCommand that receives data from the CanPlug: Ault Sixth Report, para 117 and Schedule 9; Edwards Fifth Report, para 114; Edwards Seventh Report, para 8. Mr. Ault opined that the code showed that any dldata files were immediately deleted on receipt: Ault Sixth Report, paras 118–119. Dr. Edwards did not disagree with Mr. Ault's analysis of this code, but simply stated that (a) Mr. Ault should have performed an inspection of Farmers Edge's production servers and complete code repositories (a criticism apparently directed at the deletion of Vanessa, discussed above, and not the deletion of dldata files); and (b) Mr. Ault's report confirmed other aspects of Dr. Edwards' earlier reports in respect of prior versions of the code: Edwards Seventh Report, paras 31–42. I am satisfied given this evidence that Farmers Edge has established that the modification to this component has been implemented in the FarmCommand server software.

[368] As a result, even if Farmers Edge had not established that the Vanessa component had been deleted, it has established that as of April 2022, the FarmCommand system does not have an *application program* having programming instructions that will cause the *microprocessor* to *automatically* extract content from *message data* received from a *remote relay device* connected to a *farming vehicle* or *farming implement*, and use that content in any of the ways described in element 20(f). Similarly, it has established that as of April 2022, the FarmCommand system does

not have either a *farm traffic controller* configured to receive and store *messages* produced by a *remote relay device*, the messages comprising *electronic control unit messages* generated by a *farming implement*, as required by element 38(c), or a *parameter extraction program* that determines a *farming operation land segment* based on the *electronic control unit* messages as described in element 38(d).

[369] As noted above, contrary to Farmobile's arguments, I conclude there is no stand-by utility in having deleted or unexecutable copies of the Vanessa component somewhere in Farmers Edge's archives.

G. *Conclusions on Infringement*

[370] As indicated above, I have not analyzed all of the parties' arguments regarding infringement, as some of them are determinative. However, to summarize the foregoing, I conclude that:

Asserted System Claims

- prior to the April 2021 Update, the FarmCommand system did not infringe the Asserted System Claims because the system did not comprise (i) a *data store* for storing an *implement profile* defining, for a *known farming implement*, either a *known manufacturer code* or a *known device class* (Claim 20 and dependent claims); (ii) such an *implement profile* (Claim 38 and dependent claims); (iii) an *application program* that used extracted content from *message data* acquired by a *remote relay device* to determine there is a *match* between the *farming implement* used to perform the *farming operation* and the

known farming implement of the *implement profile* (Claim 20 and dependent claims); or (iv) a *parameter extraction program* that determines a *farming operation land segment* based on the *implement profile* and *electronic control unit messages* generated by a *farming implement* and received as part of *messages* produced by a *remote relay device* (Claim 38 and dependent claims);

- if the FarmCommand system had infringed the Asserted System Claims prior to April 2021, it would have continued to do so after April 2021, but the system did not (i) extract content from *message data* received from a *remote relay device*, or use any such extracted content to perform the steps in element 20(f); or (ii) receive *messages* produced by a *remote relay device* that comprise *electronic control unit messages* as required by element 38(c), in respect of CanPlugs that were updated with the April 2021 Update and/or the July 2021 Update, which may very well have been relevant to remedies issues;

- even if the FarmCommand system infringed the Asserted System Claims, it ceased to do so in April 2022, because the system after that date did not comprise (i) an *application program* having programming instructions that, when executed, caused the *microprocessor* to extract content from *message data* received from a *remote relay device*, or use any such extracted content to perform the steps in element 20(f); (ii) a *farm traffic controller* configured to receive *messages* produced by a *remote relay device* that comprise *electronic control unit messages* as required by element 38(c); or (iii) a *parameter extraction program* that determines a *farming operation land segment* based on the *electronic control unit messages* as required by element 38(d);

Asserted Device Claims

- a CanPlug running the April 2021 Update code does not infringe the Asserted Device Claims because it is not a *relay device* that comprises (i) a *memory storage area* that stores an *implement profile* defining, for a *known farming implement*, either a *known manufacturer code* or a *known device class*; or (ii) an *application program* that extracts content from *messages* transmitted on the *message bus* and uses the extracted content to determine there is a *match* between the *farming implement* used to perform the *farming operation* and the *known farming implement* of the *implement profile*;

- even if a CanPlug running the April 2021 Update code infringed the Asserted Device Claims, a CanPlug running the July 2021 Update code does not infringe the Asserted Device Claims because it is also not a *relay device* that comprises (i) a *memory storage area* that stores descriptive information about a *farming operation land segment* associated with the *farming business*; (ii) an *application program* that uses a set of *operating events*, the *travel path*, and the descriptive information stored in the *memory storage area* to determine that the *farming operation* occurred on the *farming operation land segment*; or (iii) an *application program* that records the *farming operation* and the descriptive information for the *farming operation land segment* in the *electronic farm record*.

V. Validity

[371] Farmers Edge asserts that all of the claims of the ’742 Patent are invalid and counterclaims for a declaration to that effect. Its primary attacks are based on prior art, alleging

that some of the claims are anticipated by a prior art system offered by John Deere, and that all of the claims are obvious in light of that system, other prior art, and the CGK of the POSITA. It also raises arguments about overbreadth and patentable subject matter, as well as a sufficiency argument that is raised in the alternative to its obviousness arguments. Farmobile contests each of these arguments.

[372] I will turn to these allegations after addressing the parties' arguments with respect to positions taken in the Nebraska Litigation, referred to at paragraph [17] above.

A. *Nebraska Litigation*

[373] The parties filed a number of documents from the Nebraska Litigation, including pleadings, transcripts of submissions, expert reports from Mr. Ault and Dr. Edwards, and decisions of the Nebraska Court and the United States Court of Appeals for the Eighth Circuit. Dr. Archer, counsel for Farmobile in the Nebraska Litigation and later its General Counsel, testified at trial regarding the litigation, as did Mr. Tatge. Dr. Edwards and Mr. Ault were cross-examined on the reports they gave in the Nebraska Litigation.

[374] In the Nebraska Litigation, Farmers Edge claimed that Farmobile and Messrs. Tatge, Gerlock, and Nuss had misappropriated trade secrets learned while at Crop Ventures and had used them to apply for the US patent applications from which the '742 Patent claims priority. Farmers Edge thus sought to establish that the patent application disclosed matters that were developed at Crop Ventures and were not publicly known, while Farmobile argued that the inventive elements of the patent were only developed after Messrs. Tatge, Gerlock, and Nuss had

left Crop Ventures. Each party made submissions and filed expert evidence regarding what in the patents was new, if anything, and what was previously known.

[375] In this proceeding, each party referred to the positions taken by the other in the Nebraska Litigation, claiming that those positions should be considered inconsistent with the positions taken in this action.

[376] Farmobile notes that in the Nebraska Litigation, Farmers Edge maintained that the US patent application and the ’742 Patent were novel: Exhibit 69, pp 38–41; Exhibit 72, p 133. For example, Farmers Edge submitted that for the purposes of the Summary Judgment motion, “the requirement [under Nebraska law of conversion] that the intangible ideas at issue be novel is satisfied as to the issued Farmobile Canadian Patent,” with reference to the requirement of novelty and the presumption of validity in the *Patent Act*: Exhibit 72, p 133.

[377] Farmobile also highlights Mr. Ault’s evidence in Nebraska that the ’742 Patent was novel and non-obvious, despite his awareness of the John Deere system and other prior art documents: Ault Nebraska Report, pp 47–48; Transcript, Day 9 (CEO), pp 11–13, 16. Mr. Ault stated, for example, that Crop Ventures had “conceived and developed a business and technical strategy for a cloud-connected task controller and a cloud-connected virtual terminal” (what he termed a “split architecture” task controller) while the inventors were there, that this strategy and the details of its implementation would be considered a trade secret, and that it was publicly disclosed in the US and Canadian patent applications: Ault Nebraska Report, p 48. He further stated that the “particular architecture and strategy chosen from among the possible architectures

was not readily ascertainable without a design process including trial and error which Farmobile did not have to do": Ault Nebraska Report, p 48. Farmobile argues that the positions Farmers Edge and Mr. Ault now take on novelty and obviousness are contrary to their prior positions and should be rejected.

[378] For its part, Farmers Edge notes that Farmobile submitted to the Nebraska District Court that the only innovative aspects of the patent were the FOLS and the *travel path*, and that "[e]very other aspect of the [US] application was known in the art": Exhibit 71, pp 135, 159; Exhibit 73, para 70 and p 68. Dr. Archer stated in oral argument that the "task controller split architecture" Mr. Ault referred to was "based on something John Deere did and put out in the public domain," and that the "one narrow aspect" of what was invented was "the concept of using computer connections and data in order to track agronomic activity while it is occurring at pinpoints in the field; so we call it the farming operation land segment": Exhibit 29, pp 34–36. By analogy to a snow plow, she described the "aha moment" of invention as a device that shows not just where a truck went, but where the plow went up and down, a clear reference to the notion of a *travel path*. She submitted that the rest of the patent was unprotectable, worthless background art or prior art: Exhibit 29, p 36.

[379] In granting summary judgment to Farmobile, the Nebraska Court noted that Farmobile's patent attorney (not Dr. Archer) characterized the invention as "identifying a farming operation land segment [FOLS] and a travel path," and that Farmobile contended that the allowance of the US patent showed that the inventive aspects of the patent were the FOLS and the travel path, with all of the other claims being prior art: Exhibit 76, pp 19, 24, 37. In response to Farmers

Edge's appeal, Farmobile expressly argued that "the concept of 'implement profiles' is and was well-documented and established in the public realm," referring expressly to *implement profiles* as used in the patent, and citing what appears to be paragraph 120 of Dr. Edwards' Nebraska Report: Exhibit 79, pp 37–38; Edwards Nebraska Report, para 120. Farmers Edge therefore asserts that Farmobile conceded in Nebraska that all claim elements except the FOLS and the travel path were known, and represented that elements that Dr. Edwards now claims to be novel (such as the *implement profile*) were "well-documented and established in the public realm": Exhibit 79, p 38; Exhibit 52 [Edwards Nebraska Report], paras 100–109.

[380] In assessing these positions, it is important to recall the general positions of the parties in the Nebraska Litigation. Farmers Edge argued that certain information amounting to a trade secret, developed at Crop Ventures, had been misappropriated by Farmobile and the inventors, and disclosed in the patent. Farmobile argued that the only inventive aspects of the patent were the aspects that arose after the inventors' departure from Crop Ventures, *i.e.*, the FOLS and the *travel path*.

[381] Some of these positions were taken expressly for the purposes of the summary judgment motions, and they were all taken in the context of litigation pertaining to the Nebraska law relating to trade secrets, conversion, and other claims. Thus, while Farmers Edge did argue, for the purposes of the summary judgment motion, that the "novelty" element of the Nebraska law of conversion was met with respect to the '742 Patent, I do not consider that this position precludes Farmers Edge from challenging the validity of the '742 Patent as a matter of Canadian patent law in these proceedings, where the validity of the patent under Canadian law is directly at

issue. The Nebraska Court noted on a number of occasions that it was not dealing with a patent case: Exhibit 76, pp 2, 34, 35, 37. It also expressly stated that the "Canadian patent is of no importance to this discussion" since it had no jurisdiction over that matter: Exhibit 76, p 34, fn 23.

[382] Moreover, Farmers Edge's argument on novelty was expressly based on aspects of the invention developed before the inventors left Crop Ventures. The specific element of the patents that Mr. Ault considered a trade secret was the "split architecture" described in a Crop Ventures document: Ault Nebraska Report, pp 2, 4, 47–56; Transcript, Day 9 (CEO), pp 14–19. Farmobile responded that this split architecture was previously disclosed: Edwards Nebraska Report, para 119; Exhibit 29, p 34. In his testimony at this trial, Mr. Ault addressed his evidence in Nebraska, referring to that split architecture as relating to the location of the task controller function (typically on the device, rather than in the cloud), with reference to Claim 20, and being different from the split architecture implemented in the April 2021 and July 2021 Updates: Transcript, Day 8, pp 124–127. Thus, Mr. Ault's prior opinion in Nebraska was not simply that the '742 Patent was novel and non-obvious as a general matter, as Farmobile suggests: Farmobile Closing Slides, p 61; Transcript, Day 9 (CEO), p 11.

[383] Conversely, I find Farmobile's efforts to distance itself from its submissions in Nebraska were strained. In her evidence to this Court, Dr. Archer suggested that the District Judge who posed a question about whether Farmobile conceded that the Canadian patent was invalid was "very confused," which certainly does not appear to be the case from the transcript: Transcript, Day 7, p 32; Exhibit 29, pp 34–36. She also restated the answer she gave to the Nebraska Court,

suggesting that what she was seeking to convey was that "[t]he invention comes in the latter half of the patent where the process of […] actually figuring out how to collect the data in the system and result in the […] farming operation segment and the travel path and the electronic field record": Transcript, Day 7, pp 32–33. In other words, Dr. Archer's evidence in this Court sought to suggest that her submission in Nebraska related not just to the FOLS and the *travel path*, but also "how to collect the data in the system" and even the "system" itself: Transcript, Day 7, p 33.

[384] I am unable to read the materials in the Nebraska Litigation in this way. There is nothing in those materials that indicate Farmobile was asserting, either in its written or oral submissions or in the evidence it presented, that "how to collect the data in the system" was inventive. It is certainly not how the Nebraska Court understood matters. The Nebraska Court summarized Farmobile's position as being that "the allowance of the U.S. Farmobile patent shows that the inventive aspects of the patent were the FOLS and travel path and that all of the other claims were prior art" [emphasis added]: Exhibit 76, p 37; see also pp 19, 24.

[385] Similarly, Dr. Edwards sought to distinguish a statement he made in Nebraska that "the use of implement profiles, object pools, task controllers, virtual terminals, and working sets are described and standardized in ISO 11783" and therefore could not be confidential, on the basis that the statement was "not made in the context of the '742 Patent" and that he was not referring to an *implement profile* that includes a *communication protocol* as described in the '742 Patent: Edwards Nebraska Report, para 85; Transcript, Day 4, pp 109–110. This is clearly an error, or at best an overstatement, as the statement in question directly responded to pages in Mr. Ault's

Nebraska Report analyzing the claims of the Canadian and US patents: Ault Nebraska Report, pp 1–2, 10–14.

[386] Indeed, in the paragraphs of his report immediately preceding the one he sought to distinguish, Dr. Edwards had quoted a passage from Mr. Ault's Nebraska Report directly addressing element 1(d)(iii), and expressing the opinion that the CanPlug was "intended to create and maintain known implement profiles from the manufacturer code, device class, and object pool version which identified details of the communication protocol used by each," noting that "this is precisely the sort of information described in the ISO11783 standard": Ault Nebraska Report, p 10; Edwards Nebraska Report, paras 83–84. When this was brought to his attention, Dr. Edwards asserted that the passage described Mr. Ault's characterization of *implement profiles* and *communication protocols*, which was not his characterization: Transcript, Day 4, pp 110–111. Dr. Edwards' explanation is unconvincing. He expressly agreed with Mr. Ault's statement, made to compare the CanPlug to the contents of element 1(d)(iii) of the Canadian and US patents, that the functions and designs of the CanPlug relating to the use of *implement profiles*, are described and standardized in ISO 11783.

[387] On the trade secret issue, the Nebraska Court rejected Farmers Edge's claim that anything confidential developed at Crop Ventures had been disclosed in the patent. It concluded that "[t]he record shows that the information [Farmers Edge] claims as a trade secret is freely available throughout the industry": Exhibit 78, pp 12–13. In doing so, it effectively rejected Mr. Ault's evidence that the particular architecture shown in the Crop Ventures document was a novel, non-obvious, trade secret. This is the very evidence Farmobile now seeks to rely on.

[388] On the patent ownership issue, the Nebraska Court similarly concluded, in *obiter*, that the evidence suggested that "any inventive concept would have been conceived and reduced to practice after [the inventors] left Crop Ventures," that is, the FOLS and *travel path*: Exhibit 76, p 37.

[389] The foregoing being said, the relevant issues in this case are whether, on the basis of the evidence filed in this Court and the principles of Canadian patent law, Farmers Edge has established that the '742 Patent is anticipated and/or obvious. Given the context of the Nebraska Litigation and the legal issues in that proceeding, I conclude it is more appropriate and efficient to simply address the Canadian issues on their merits, rather than with reference to the parties' respective positions in Nebraska. Thus, Farmers Edge must establish that all aspects of the claims of the '742 Patent were not novel and/or are uninventive, regardless of whether Farmobile previously insisted to the Nebraska Court that they were in the prior art.

[390] As a final note, while this matter was under reserve, Farmobile candidly advised the Court that the Nebraska Court, in a different proceeding than the Nebraska Litigation referred to above, had declared five US patents owned by Farmobile to be invalid: *AGI Suretrack LLC* v *Farmers Edge Inc*, No 8:22-CV-00275 (D.Neb., April 11, 2024). The representative claim on which this decision is based, Claim 1 of US Patent No 11,126,937, is largely the same as Claim 1 of the '742 Patent, but it refers to "a plurality of implement profiles" rather than "an implement profile." It similarly refers to determining a match to "the known farming implement corresponding to one of the plurality of implement profiles" and thereafter using the "known communication protocol defined by said one of the plurality of implement profiles" to determine

the set of operating events and the travel path. On summary judgment, the Nebraska Court found the patents were directed to patent-ineligible subject matter under 35 USC §101. Farmobile has appealed the decision. This decision has no impact on the following analysis.

B. *Anticipation*

[391] Farmers Edge alleges that Claims 1, 3, 4 and 7 to 19 of the ’742 Patent (*i.e.*, all of the device claims except Claims 2, 5, and 6) are anticipated by a precision agriculture tool offered by John Deere known as the GreenStar 3 2630 Display [GreenStar 3].

[392] For the reasons below, I accept Farmers Edge’s allegations with respect to Claims 1, 3, 4, 7 to 13, 15, and 17 to 19 of the ’742 Patent and conclude that these claims are invalid for anticipation.

(1) Principles

[393] A patent will be invalid for anticipation if the invention it claims has been previously disclosed: *Patent Act*, ss 2(“invention”), 28.2; *Eli Lilly Canada Inc v Novopharm Limited*, 2010 FCA 197 [*Lilly Olanzapine*] at para 43. To constitute prior disclosure that invalidates a patent claim for anticipation, a prior art reference must (1) disclose subject matter which, if performed, would necessarily result in infringement (“disclosure”); and (2) provide enough information to enable the POSITA to perform the claimed invention without the exercise of inventive ingenuity or undue experimentation (“enablement”): *Apotex Inc v Sanofi-Synthelabo Canada Inc*, 2008 SCC 61 at paras 24–37 [*Sanofi*]; *Shire* at paras 26–27, 36–40; *Hospira Healthcare Corporation v Kennedy Trust for Rheumatology Research*, 2020 FCA 30 at para 66.

If a published reference fails to either disclose or enable the essential elements of a claim, the claim is not anticipated: *Shire* at para 36.

[394] The prior art disclosure must be a single publication that discloses each essential element of the claim, as it has been construed: *Sanofi* at para 28; *Eli Lilly Canada Inc v Mylan Pharmaceuticals ULC*, 2015 FC 125 at para 145; *Free World Trust* at para 26; *Whirlpool* at paras 43, 49(a)–(b). The disclosure need not be an exact description of the claimed invention, provided the POSITA, "trying to understand what the author […] meant," can understand the prior disclosure without trial and error: *Sanofi* at paras 23, 25, 32, citing *Synthon BV v SmithKline Beecham plc*, [2005] UKHL 59 at para 32. As the Federal Court of Appeal recently described the issue of disclosure, a prior art reference discloses the claimed invention when, if performed, the prior art reference would necessarily result in the infringement of the patent claim: *Shire* at para 37. Justice Rennie termed this the "necessarily infringe test": *Shire* at paras 44, 50.

[395] If the subject matter of the invention is disclosed, the POSITA is assumed to be willing to make trial and error experiments to get it to work, and may use their CGK to supplement the information in the prior art to this end: *Sanofi* at paras 27, 33, 37.

(2) John Deere's GreenStar 3 2630

[396] One of the precision agriculture tools John Deere offered prior to the priority date of September 23, 2013, is a display monitor known as the GreenStar 3 2630 Display [GreenStar 3]: Schleicher Affidavit, Exhibit 143, para 2(d) and Exhibit C [GS3 Manual] and D.

[397] Mr. Ault and Dr. Edwards each gave evidence regarding the GreenStar 3 in their reports and at trial: Ault First Report, paras 259–280; Edwards Second Report, paras 183–285; Ault Third Report, paras 2–46; Edwards Fourth Report, paras 7–32; Transcript Day 3, pp 40–48; Day 4, pp 117–118; Day 8, pp 89–101. The following description of the GreenStar 3 is based on aspects of that evidence that are not materially in dispute. Further details are discussed below in considering the parties' arguments on disclosure and enablement.

[398] The GreenStar 3 is designed to be installed and used in the cab of agricultural equipment. It has a touchscreen monitor that displays information and allows the user to input information, see and record farming activity, and control functions of the farming vehicles and implements. The unit can be connected to an ISOBUS via a plug, and is compatible with ISO 11783 farming equipment, receiving data transmitted by them over the ISOBUS. The GreenStar 3 can be used to create real-time as-applied maps of a field. The field's boundaries, including exterior, "passable interior," and "impassable interior" boundaries, can be uploaded to the device, or can be recorded by the GreenStar 3.

[399] As of a software update in 2012, the GreenStar 3 had a feature called "John Deere Implement Detection," which allowed it to automatically recognize any ISO 11783 compatible implement and auto-populate the machine settings sent through the ISOBUS connection to the display. When such an implement is connected to the message bus to which the GreenStar 3 is connected, the GreenStar 3 detects the implement and displays information about it, such as the manufacturer, implement type, and unique identifier, while populating data about the implement such as its width and offsets.

[400] Farming data from the GreenStar 3 could be exported to an FMIS through a USB thumb drive or via a cellular network. The GreenStar 3 can also be accessed remotely via a cellular network using a service known as JDLink.

(3) Farmobile's general arguments

[401] Before turning to the specific elements of the claims, I will address two broader arguments that Farmobile presents in response to Farmers Edge's allegations based on the GreenStar 3.

[402] Farmobile argues as a general proposition that the GreenStar 3 cannot anticipate the '742 Patent because its internal software architecture and logic are proprietary. It argues that since details of its operation have been kept secret and its underlying code and functionality is confidential "it necessarily fails to disclose" the invention of the device claims, and that it would be a "fundamental error of law" to invalidate a patent for anticipation based on a system whose underlying code is confidential. To the extent that this is asserted as a general proposition, I disagree. The relevant question is whether the essential elements of the challenged claims are disclosed, and whether the disclosure would enable the POSITA to work the patent, *i.e.*, perform the claimed invention, not to recreate the prior art device exactly as it is: *Western Oilfield* at para 84. If the confidential or undisclosed aspects of the prior art (*e.g.*, its specific architecture or logic) are not relevant to the essential elements as claimed, this does not prevent the prior art from being anticipatory.

[403] This is confirmed by the decision of the Federal Court of Appeal in *Baker Petrolite Corp v Canwell Enviro-Industries Ltd*, 2002 FCA 158. There, in addressing the question of anticipation through the availability of a product, Justice Rothstein noted that what was necessary was that the prior disclosure enable not the reproduction of the product, but the subject-matter of the invention:

> It is not necessary that the product that is the subject of the analysis be capable of exact reproduction. It is the subject-matter of the patent claims (the invention) that must be disclosed through the analysis. Novelty of the claimed invention is destroyed if there is disclosure of an embodiment which falls within the claim.
>
> [Emphasis added; *Baker Petrolite* at para 42(8).]

[404] I note in this regard Farmobile's reliance on Dr. Edwards' observation that John Deere must keep their source code proprietary because they believe it contains trade secrets: Farmobile Responding Submissions, para 40; Transcript, Day 4, p 118. There is no evidence before the Court as to why John Deere keeps its source code proprietary or, more importantly, that any concern about trade secrets has to do with the software functions relevant to the '742 Patent. In any event, as noted, the specific coding that John Deere uses to achieve the functionality of the GreenStar 3 is not at issue. What is at issue is whether the GreenStar 3 discloses the elements of the '742 Patent, and whether a POSITA would be enabled to perform the invention using their CGK.

[405] Farmobile next argues the GreenStar 3 cannot anticipate the '742 Patent because it can only be used with certain John Deere and ISO 11783 compatible implements, and is therefore not directed to the same interoperability problem the '742 Patent addresses. I reject this general submission for two reasons.

[406] First, the issue in assessing anticipation is, again, whether the essential elements of the claims are disclosed and enabled. It is not whether the prior art is "directed to the same problem," unless that is an essential element of the claim. To the contrary, it is an error to distinguish prior art based on a matter that is not an essential element of the challenged claim: *Hospira* at paras 71–74. In other words, for a piece of prior art to anticipate a claim, it must disclose the invention *as claimed*, and not some characterization of the claim by the inventor. Were it otherwise, the patentee would effectively be obtaining protection for something they did not claim, contrary to both the *Patent Act* and the bargain theory of patents: *Free World Trust* at para 13. I have discussed above at paragraphs [193] to [204] the reasons I reject Farmobile's construction arguments—which appear to have been largely designed to avoid prior art systems—that the claims of the '742 Patent include as an essential element the ability to achieve "interoperability" by being capable of having multiple *implement profiles*.

[407] In this regard, Farmobile is essentially seeking to incorporate into the anticipation analysis a particular advantage or benefit it says flows from the devices claimed in the '742 Patent, namely that of interoperability. They do so with reference to the discussion of "special advantages" in *Sanofi* and *Shire*. However, nothing in the discussion in *Shire* can be taken as contradicting the general principle from *Hospira* that it is an error to distinguish prior art based on something that is not an element of the claim, given that the Court of Appeal in *Shire* expressly reaffirmed *Hospira*: *Hospira* at para 71; *Shire* at paras 36, 44. Indeed, as Farmers Edge points out, the Federal Court of Appeal has subsequently questioned whether the discussion of "special advantages" in *Sanofi* and *Shire* is helpful in assessing inventiveness outside the context of selection patents: *Swist* at paras 69–77.

[408] Second, even if it were relevant, the ability to use the GreenStar 3 with various implements, including non-John Deere implements, does involve a degree of interoperability, by allowing the GreenStar 3 to be used with a number of different implements and understand the language of each, including those adopting the language of ISO 11783, a standard that itself is addressed to interoperability. The fact that the GreenStar 3 cannot be used with non-John Deere implements that use proprietary message formats is irrelevant, as there is nothing in Claim 1 of the ’742 Patent, or any of the claims, that require the *messages* transmitted on the *message bus* to be sent in a proprietary format, or the device to store a *communication protocol* that is proprietary or that has been reverse engineered.

[409] I am not persuaded by Farmobile’s argument that the GreenStar 3’s implement detection functionality is designed not to address interoperability, but to save operators’ time associated with manually inputting information regarding an implement’s parameters. There is clearly overlap between these concepts. Indeed, given the ’742 Patent’s focus on recognizing the implement and determining its communication protocol automatically by computer, it can certainly be considered to be directed to issues of efficiency. The ’742 Patent itself refers to one of its advantages compared to the prior art as being that it is “easy to use.” Attempting to distinguish the GreenStar 3 on the basis that its functionalities are directed to “saving time,” while those of the ’742 Patent are not, is misguided.

[410] With these general observations in mind, I turn to the question of whether the GreenStar 3 discloses and enables the essential elements of Claim 1 of the ’742 Patent.

(4) Claim 1

[411] After reviewing available information regarding the GreenStar 3, including Mr. Ault's First Report and the GS3 Manual, Dr. Edwards identified only four elements of Claim 1 that he considered were not disclosed or enabled by the GreenStar 3: (a) a *communication protocol* associated with an *implement profile*; (b) the automatic identification of a *communication protocol* for the implement based on messages transmitted by the implement; (c) the use of a known *communication protocol* defined by the *implement profile* to determine a set of *operating events* and a *travel path*; and (d) a *travel path*: Edwards Second Report, paras 277–285; Edwards Fourth Report, paras 7–25. Farmobile's somewhat scattergun approach to its closing submissions on anticipation referred to a number of arguments, including those addressed above, but to my comprehension did not identify any elements of Claim 1 not disclosed or enabled by the GreenStar 3 other than the foregoing and "the specific combination of elements included in claim 1": Farmobile Responding Submissions, paras 20–64, and in particular para 41. I will therefore focus on these elements, but for good measure will also briefly address the elements that appear to be uncontested.

[412] I also note at the outset of this discussion that I found Mr. Ault's reports and evidence on this issue consistent, documented, and persuasive. He explained, with reference to the published information on the GreenStar 3, and in particular its user manual, why the POSITA would understand the GreenStar 3 to disclose each element of the device claims at issue, and why he disagreed with Dr. Edwards' views. He was not cross-examined on these issues, beyond being asked whether he was aware of the GreenStar 3 when he gave his opinion in Nebraska:

Transcript, Day 9, pp 11–12. As noted above, Mr. Ault's Nebraska opinion was that the novelty lay in a particular "split architecture" irrelevant to Claim 1.

[413] Dr. Edwards' evidence was at times less clear, changed somewhat over time, appeared unwilling to understand the GS3 manual as a POSITA would understand it, and appeared to adopt an approach to the prior art that was different from that he took in assessing infringement by Farmers Edge. Although Dr. Edwards also only faced limited cross-examination on the issues, my assessment of the evidence contained in Mr. Ault and Dr. Edwards' reports and evidence in chief leads me to find Mr. Ault's more reliable and persuasive on these issues. I explain in further detail below.

Introductory language

[414] There is no dispute that the GreenStar 3 is a *relay device* for *tracking farming operations* for a *farming business*: Ault First Report, paras 306, 320(g); GS3 Manual, pp 16–17, 70–77. The POSITA, with skill in designing, building, and programming agricultural devices and systems, including academic and work experience in computer science and agriculture, would also be enabled to work this essential element. Farmobile does not argue otherwise.

(a) *a microprocessor*

[415] There is similarly no dispute that the GreenStar 3 comprises a *microprocessor*. I note in this regard that it does not matter if, for example, the GreenStar 3 or its manual does not expressly state that it has a *microprocessor*, or does not call it that by name. The question is

whether the POSITA trying to understand the prior art would understand it to disclose this element, *i.e.*, that the disclosed device necessarily has the element as construed: *Lilly Olanzapine* at para 44; *Sanofi* at para 25; *Shire* at paras 42, 44. As Dr. Edwards notes, a *microprocessor* is part of every computer system: Edwards First Report, para 63. Again, the POSITA would be enabled to practice this element.

> (b) *a bus connector for connecting the relay device to a message bus on a farming vehicle or farming implement, wherein the message bus is configured to carry messages generated by the farming vehicle or the farming implement while the farming vehicle and the farming implement are used to perform the farming operation*

[416] The GreenStar 3 discloses a *bus connector* for connecting the *relay device* to a *message bus* on a *farming vehicle* or *farming implement*. In particular, the GreenStar comes with an ISO 11783 standard plug allowing it to connect to an ISOBUS: Ault First Report, para 265; GS3 Manual, p 362. The POSITA would be enabled to practice this element given their knowledge of, among other things, the ISO 11783 standard.

> (c) *a global positioning system receiver that receives position and time signals from space-based satellites while the farming operation is performed*

[417] The GreenStar 3 discloses a GPS receiver, which the parties agree may be connected to rather than contained within the *relay device*: Ault First Report, paras 260, 306; GS3 Manual, pp 16, 77. The POSITA would be enabled to practice this element given their knowledge of agricultural devices and systems.

(d) *a memory storage area that stores (i) an electronic farm record for the farming business, (ii) descriptive information about a farming operation land segment associated with the farming business*

[418] As set out above, an EFR is a record that contains general information about the *farming business*, as well as detailed descriptions for each *farming operation* carried out at the *farming business*, while a FOLS is the area where a *farming operation* takes place. The GreenStar 3 discloses memory that stores general information about the *farming business*, detailed descriptions of *farming operations* being carried out, and information about the field or area where the *farming operation* takes place: Ault First Report, paras 260–264; GS3 Manual, pp 53–55, 69–88. The POSITA would also be able to work these essential elements of the invention without undue burden given their skill in designing and programming agricultural devices and systems.

(iii) an implement profile defining, for a known farming implement, a known manufacturer code, a known device class, a known version and a known communication protocol

[419] The next issue is whether the *memory storage area* of the GreenStar 3 stores an *implement profile* defining, for a *known farming implement*, a *known manufacturer code*, a *known device class*, a *known version* and a *known communication protocol*.

known manufacturer code, known device class, known version

[420] The GS3 Manual discloses that the GreenStar 3 stores information about known farming implements, including ISO implements: GS3 Manual, pp 367–373; Ault First Report, paras 274–275. This includes the manufacturer, the implement type, model, and name. This data is stored to

the GreenStar 3's internal memory. Mr. Ault explained that the POSITA would recognize the information, including the hexadecimal "Name/SN" shown in the GS3 Manual, as the NAME field sent by the ISO implement: Ault First Report, paras 273, 320(b); Ault Second Report, para 115; Transcript, Day 8, pp 96–97. Dr. Edwards did not disagree. As set out above, and as the POSITA would know, the NAME field includes the *manufacturer code*, *device class*, and a unique identifier, which the parties agree would fall within the POSITA's understanding of a *version*.

[421] For ISO implements, this information is obtained from the implement when it is first connected as part of the John Deere Implement Detection functionality. It is then stored in the GreenStar 3. I am satisfied that the storage of such information creates an *implement profile* defining a *known manufacturer code*, a *known device class*, and a *known version* within the meaning of Claim 1, and that the GreenStar 3 therefore discloses a *memory storage area* that stores an *implement profile* with those parameters. The POSITA, familiar with programming agricultural devices and with the ISO 11783 standard, would be enabled to practice this aspect of the invention disclosed.

[422] As Farmers Edge notes, the GS3 Manual actually uses the term "implement profile" to refer to the collection of data stored about an implement: Ault Second Report, paras 23–24. While the particular use of the term appears to refer to what is stored in the APEX software, John Deere's FMIS, rather than on the GreenStar 3, it is clearly being used to refer to the information and data stored in respect of a particular implement, including its implement profile

and name: GS3 Manual, p 373. In any event, as noted above, the issue is not what terminology is used, but whether the GreenStar 3 discloses and enables the essential elements as construed.

[423] I make one further observation on this point. While I have concluded that Claim 1 only requires the device to store a single *implement profile*, the GreenStar 3 clearly stores multiple *implement profiles*. Thus, even on Farmobile's proposed construction in which the *relay device* must be able to store multiple *implement profiles*, the GreenStar 3 discloses and enables this element. While Farmobile argues that the GreenStar 3 does not disclose an *implement profile* that includes a non-John Deere proprietary *communication protocol*, there is no requirement in Claim 1, or anywhere in the '742 Patent, that the *relay device* store *implement profiles* that go beyond ISO implements or a particular manufacturer's implements.

known communication protocol

[424] Mr. Ault contends that the GreenStar 3 will read messages from an ISO implement using the *communication protocol* defined by the ISO 11783 standard and that this *communication protocol* is included in the *implement profile* in the GreenStar's memory: Ault First Report, para 320(c), Ault Third Report, paras 19–39. Dr. Edwards asserts that the GreenStar 3 does not disclose that it associates a *communication protocol* "with each implement profile": Edwards Second Report, paras 211–213; 237, 240, 278. In particular, he asserts that information such as the width of the implement and its offsets are not a *communication protocol*, but simply physical characteristics of the implement: Edwards Second Report, paras 250, 278; Edwards Fourth Report, paras 12–20.

[425] In my view, it would be clear to the POSITA that the *implement profile* of the GreenStar 3 includes a *communication protocol*, that is, a set of rules that "describes the meaning, format, and encoding of ECU messages" (the "language") the implement uses to communicate farming operation data: Transcript, Day 3, p 2; Edwards First Report, para 73. The GS3 Manual makes clear that having identified an ISO compliant implement, it is able to communicate with that implement and understand the farming data being sent. It thus uses the *communication protocol* applicable to that implement. As Dr. Edwards concedes, "[o]f course, the GreenStar 3 monitor must include and employ a communication protocol to send and receive data from the ECUs": Edwards Fourth Report, para 21; see also discussion of Device Description Object Pools at Ault First Report, paras 116–118; Ault Third Report, paras 87–91; Edwards Second Report, para 22; Edwards Fourth Report, para 49.

[426] The *communication protocol* defined by the ISO 11783 standard may be a standard and open *communication protocol*, but it remains a *communication protocol*: Ault First Report, paras 71, 164–171, 320(b), Exhibit U. As Dr. Edwards notes, if a farming implement strictly adheres to the ISO 11783 standard, "then the implement's communication protocol is simply the protocol specified in the standard": Edwards Second Report, para 254; Edwards Fourth Report, para 14. As discussed above, there is nothing in Claim 1 that requires the *communication protocol* to be, or include, a proprietary or non-standard *communication protocol*. More specifically, or expressed in a more technically accurate manner, there is nothing in Claim 1 that requires the *communication protocol* for the *known farming implement* to include a reverse-engineered "mapping" between ECU parameters and ISO virtual terminal object numbers or PGNs defined for proprietary messages and an ability to understand those proprietary messages. The fact that

the *communication protocol* of Claim 1 may include such a proprietary *communication protocol* does not make it a required essential element of the claim: Edwards Second Report, paras 60, 64; Ault Third Report, para 32.

[427] In terms of whether the *communication protocol* is found within the *implement profile*, Dr. Edwards claims there was no disclosure in the GS3 Manual that the *implement profile* is connected to or includes a *communication protocol*: Transcript, Day 3, p 45. However, Dr. Edwards' own evidence, and Farmobile's position when addressing issues of infringement, was that aspects of the *implement profile* could be stored in multiple places, and that effectively wherever the *communication protocol* was stored became part of the storage of the *implement profile*, provided it was sufficiently associated to allow the device to use the *communication protocol*: Edwards First Report, paras 187, 190–191; Edwards Fifth Report, paras 65–70; Farmobile Closing Submissions, paras 125–126; Transcript, Day 12, pp 83–86, 99–100, 122, 156–158, 163–164. Dr. Edwards also opined that multiple *communication protocols* could be stored together in a single file, which was simply a "stylistic choice of the programmers": Edwards Sixth Report, paras 35–36. On Farmobile's own approach to the *implement profile*, the *communication profile* of the GreenStar 3, which is present on the device and allows it to communicate with a farming implement once the implement is identified as an ISO implement through its *manufacturer code*, *device class*, and unique identifier, is part of the *implement profile*.

[428] Dr. Edwards also asserts that the GreenStar 3 does not disclose that it associates a *communication protocol* with <u>each</u> *implement profile* or that it "selects from among multiple

communication protocols": Edwards Second Report, para 211; Edwards Fourth Report, para 21. I reiterate that Claim 1 only requires there to be one *implement profile* and one *communication protocol*. I have explained why I reject the theory that it also requires the possibility or intention to store more than one. In any event, there is nothing in Claim 1 that indicates that the *implement profiles* of various farming implements must have <u>different</u> *communication protocols*. To the contrary, the POSITA would recognize that many farming implements use the same *communication protocol*. I find that the GreenStar 3 discloses an *implement profile* that comprises, in addition to the *known manufacturer code*, *known device class*, and *known version*, a *communication protocol* for the *known farming implement*.

[429] On enablement, Dr. Edwards asserts that the GreenStar 3 does not enable a *communication protocol* associated with an *implement profile* because it "does not provide instructions to the skilled person to enable them to work or develop the technologies": Edwards Second Report, paras 255, 284. This again appears to be based on the fact that the software in the GreenStar 3 is proprietary, such that the GreenStar 3 does not teach *how* it stores or uses a *communication protocol*: Edwards Second Report, para 255; Edwards Fourth Report, paras 21, 24. This is irrelevant, as discussed above. A POSITA skilled in the art of designing and programming agricultural devices, seeing the GreenStar 3 and its use of an *implement profile* that included a *communication protocol* would be fully able to use that disclosure to associate an implement's identity data with its *communication protocol* and thereby work this element of the invention: Ault First Report, paras 316–317.

(e) *an application program comprising programming instructions that, when executed by the microprocessor, will cause the microprocessor to automatically*

(i) extract content from one or more messages transmitted on the message bus and use the extracted content to determine that there is a match between the farming implement used to perform the farming operation and the known farming implement of the implement profile

[430] As I have construed this claim element, the *match* must be determined on the basis of (a) content from *messages* transmitted on the *message bus*; and (b) using one or more of the parameters found in the *implement profile*, namely the *manufacturer code*, *device class*, and *version*.

[431] Mr. Ault opines that the GreenStar 3 discloses that when an ISO implement is connected for the second time, the device will *automatically* detect the implement by matching the *manufacturer code*, the *device class* and the unique identifier (within the scope of a *version*), and will load the *implement profile*, thereafter reading messages using the *communication protocol* associated with the device, namely the ISO 11783 protocol: Ault First Report, paras 274–275, 307, 320(b), (c); Ault Third Report, paras 113–115.

[432] Dr. Edwards contends that the GreenStar 3 does not disclose that it *automatically* identifies a *communication protocol* for the implement based on messages transmitted by the implement: Edwards Second Report, para 211. I disagree. As Mr. Ault notes, the GS3 Manual states that the ISO implement "sends a unique identifier to the [GreenStar 3] display each time the implement is connected," that this identifier (*i.e.*, the NAME field) "distinguishes the

connected implement from other implements," and that the unit will recognize the unique identifier and load data from its internal memory: GS3 Manual, pp 367–368; Ault First Report, paras 274–275. The POSITA would recognize this as the GreenStar 3 using extracted content from *messages* transmitted on the *message bus* and using that content to determine there is a *match* between the attached *farming implement* and the *known farming implement* of the *implement profile*. This content used to determine a *match* includes at least one of, and indeed includes all three of, the *manufacturer code*, *device class*, and *version*. The GreenStar 3 expressly discloses that it recognizes a *farming implement* based on this information, thereby recognizing it to be an ISO implement, and thereby knows to use the implement's *communication protocol*.

[433] Dr. Edwards' statement that the GreenStar 3 does not disclose that it "selects from among multiple communication protocols by matching an implement profile to an implement, as taught by the 742 Patent" also relates to the matching step: Fourth Report, para 12. I have addressed that statement above. Claim 1 does not require a selection from among multiple *communication profiles*.

[434] I find the GreenStar 3 discloses an *application program* that *automatically* extracts content from one or more *messages* transmitted on the *message bus* and uses that content to determine there is a *match* between the *farming implement* used to perform the *farming operation* and the *known farming implement* of the *implement profile*. I also find that this disclosure would enable the POSITA to work this element of the invention. Again, the particular coding by which the GreenStar 3 conducts the match is not relevant. No particular coding or

method is claimed in Claim 1 beyond conducting the *match* based on content extracted from *messages* transmitted on the *message bus* and matching it with the *manufacturer code*, *device class*, or *version* of the *implement profile*. To the extent that developing such coding might entail some trial and error by the POSITA, it would not impose an undue burden.

> (ii) use the extracted content, the position and time signals and the known communication protocol defined by the implement profile for the known farming implement to determine a set of operating events and a travel path for the farming operation

[435] As discussed above, this element requires the software on the device to use extracted content from the *messages* transmitted over the *message bus*, together with position and time signals from the GPS and the *communication protocol* to determine a *set of operating events* (a set of actions occurring during farming, such as activating or deactivating the farming implement), and a *travel path* (the specific area of land where the farming operation is performed, excluding areas where it is not performed).

[436] Mr. Ault asserts that the GreenStar 3 discloses this element through its discussion of coverage maps and the use of an implement specific "recording source" to start and stop data logging based on when the implement is active or inactive: Ault First Report, paras 260–264, 307–308; Ault Third Report, paras 2, 5–18. As Mr. Ault notes, the GS3 Manual states that the GreenStar 3 can produce either an "As-Applied coverage map," which shows "where the vehicle has applied product," or a "Coverage Only map," which shows where the machine has been in the field: Ault First Report, para 263; GS3 Manual, pp 76, 326. Example "as-applied" maps, showing areas where the implement has applied and not applied product, are given in the

manual: GS3 Manual, pp 76–77; Ault First Report, paras 262–263, 320(e). These images, like the image of the *travel path* in Figure 1 of the ’742 Patent, reproduced at paragraph [208] above, show a tractor towing an implement, with a map showing where the implement has applied product, and leaving out an area where it has not applied product.

[437] Dr. Edwards asserts that the GreenStar 3 did not disclose the use of a *communication protocol* to “speak the language” of an implement and determine *operating events* or a *travel path*: Edwards Second Report, paras 213, 240, 278, 280–281. Again, I disagree. With respect to *operating events*, as explained above, the GreenStar 3 clearly uses the ISO 11783 *communication protocol* to speak the language of an ISO implement and understand its messages. These include *operating parameters* such as seed rates, spray rates, or harvest yields: GS3 Manual, p 76. It also includes information regarding the status of the implement, such as whether a hitch is above or below 70% raised: Ault Third Report, para 7; GS3 Manual, p 1949; Edwards Fourth Report, para 8. The GreenStar 3 thus expressly discloses recognizing and acting on changes in *operating parameters*, *i.e.*, an *operating event*.

[438] I note in this regard that I accept Mr. Ault’s evidence regarding how the POSITA familiar with farming equipment would understand the GS3 Manual’s discussion of “recording sources,” and reject Dr. Edwards’ assertion that this calls for speculation regarding the internal workings of the software: Ault Third Report, paras 6–14; Edwards Fourth Report, paras 17–20. While Dr. Edwards may be correct that a “recording source” is not itself a *communication protocol*, something Mr. Ault did not assert, it is clear that it describes the source of farming information, and that the GreenStar 3 allows the user to set which recording source will be used to trigger

whether the system records information or not: GS3 Manual, pp 209–210; Ault Third Report, paras 7–10; Transcript, Day 9, pp 97–98. The system expressly notes that the function of automatically turning recording on and off for the purpose of documentation and coverage maps can be used with "Task Control Unit compliant implements": Ault Third Report, paras 64–65. As the GS3 Manual states, when the ISO implement is recognized, the implement detection message indicates that Task Controller communication is active: GS3 Manual, p 367. The GreenStar 3 thus discloses to the POSITA the use of a *communication protocol* to automatically recognize *operating events* such as the activation or inactivation of an implement.

[439] With respect to the *travel path*, Dr. Edwards initially asserted that the GreenStar 3 did not disclose the determination of a *travel path* at all: Edwards Second Report, paras 223–225, 236, 282. This opinion was based on an assertion that the "as-applied" maps in the GS3 Manual described above showed the areas where the farming implement is not active with a different colour, instead of excluding it altogether: Edwards Second Report, paras 225, 282. Dr. Edwards' opinion on this issue is, as Mr. Ault points out, directly contrary to the opinion he gave in respect of infringement, in which he concluded that Farmers Edge's use of different colours was sufficient to satisfy the properties of a travel path: Edwards First Report, paras 215–218; Ault Third Report, paras 80–83.

[440] Dr. Edwards and Farmobile wisely chose not to press this point at trial, focusing instead on the issue of enablement of the *travel path*. Indeed, Dr. Edwards appeared to retract his assertion that the GreenStar 3 did not disclose a travel path: Transcript, Day 3, p 48, referring to Exhibit 31, p 220; Day 4, pp 117–118. In any event, I reject Farmobile's colour-based argument

as providing no basis for distinction between the GreenStar 3 and the ’742 Patent. There is nothing in the ’742 Patent that says anything about how the “hole (or gap)” in a *travel path* that represents an unplanted or unsprayed area is displayed, or what colour it must be shown in to meet the requirements of the patent. This colour issue was the only basis on which Dr. Edwards sought to distinguish between “as-applied” maps and the *travel path* of the ’742 Patent: Edwards Second Report, para 277. I am satisfied that the “as-applied” maps available on the GreenStar 3 as illustrated in its manual showed the area of the farm where an actual farming operation occurred, excluding areas where it was not performed, and thus constituted a *travel path* as that term is used and defined in the ’742 Patent.

[441] On the issue of enablement, Farmobile’s arguments are based entirely on the GreenStar 3 being proprietary, such that the POSITA would not know the “internal logic” used to accomplish this function: Farmobile Responding Submissions, paras 39(a), (d); Edwards Fourth Report, paras 7–11; Transcript, Day 4, pp 117–118. The argument is again effectively that the POSITA would not know *how* the GreenStar 3 in particular is programmed to display a *travel path*. At the risk of repetition, this is not the relevant question. The ’742 Patent does not claim, or even disclose, a particular software architecture or method for determining a *travel path* beyond using extracted content from the *implement* and position and time signals from a GPS. The question is whether the POSITA, seeing the disclosure of a *travel path* in the GreenStar 3, would be able to work the patent by building and programming a device that performs the disclosed function as claimed in the ’742 Patent. I have no question that they would. Indeed, the POSITA would recognize that there is no other way of automatically generating an “as-applied” map other than by using data from the farming implement and position and time signals from a GPS.

[442] I therefore conclude that the GreenStar 3 disclosed and enabled the use of extracted content, position and time signals from a GPS and a *known communication protocol* defined by the *implement profile* for the *known farming implement* to determine a set of *operating events* and a *travel path* for the *farming operation*.

> (iii) use the set of operating events, the travel path and the descriptive information stored in the memory storage area to determine that the farming operation occurred on the farming operation land segment

[443] As noted above, the construction of this element was not in dispute. As Dr. Edwards described it, the element means "the application program checks where the implement traveled and where events took place during the farming operation to identify or confirm the FOLS at which the operation was performed": Edwards Second Report, para 70.

[444] Mr. Ault's opinion was that the GreenStar 3 could be set up to automatically select the field in which a farming operation takes place based on previously-defined and saved fields: Ault First Report, paras 278, 320(f); GS3 Manual, pp 70–71. As Mr. Ault indicates, the GreenStar 3 allows the operator to turn on a "Field Locator" functionality. When the Field Locator is on, driving on to a field that has a defined boundary (*i.e.*, a FOLS stored in memory) will generate a list of fields, allowing the user to confirm the field. Dr. Edwards contends that the requirement for user input means that the determination is not done *automatically*, and again, that the GreenStar 3 does not disclose how the determination is done: Edwards Second Report, paras 217–221, 283. Dr. Edwards did not speak to this element in his evidence at trial.

[445] Again, I find Dr. Edwards' approach inconsistent with his approach to construction and infringement. As noted above, Dr. Edwards was of the view that the term *automatically* in element 1(e) did not mean that there could not be some human input to initiate the program. This was material to his conclusion that a modification proposed by Mr. Ault, in which there was a break in execution flow owing to a human having to initiate a step, would still infringe element 1(e): Edwards Third Report, para 38. I have concluded above at paragraphs [172] to [174] that the use of the term *automatically* does not mean that the claim is avoided simply by requiring a user to click a button. In doing so, I noted, and accepted, Farmers Edge's position that asking for a user confirmation does not alter the fact that the field was automatically identified in the first place: Ault Third Report, paras 38–39. In the same way that Farmers Edge could not avoid element 1(e), and thus infringement of Claim 1, by inserting a user-click confirmation, such a user-click confirmation does not take the prior art out of the scope of Claim 1.

[446] As Dr. Edwards pointed out in construing this element, the '742 Patent explains that the software "compares the position information (such as longitude and latitude coordinates) received by the GPS receiver 410 during the performance of the farming operation to location information (such as longitude and latitude coordinates) stored in the collection of FOLS descriptions 445 to determine which FOLS described in the collection of FOLS descriptions is the FOLS where the farming operation is carried out": Edwards First Report, para 88; Edwards Second Report, para 70. This is precisely what the POSITA would understand is disclosed in the GreenStar 3.

[447] With this disclosure, the POSITA would be enabled to implement this element of the claim. I note that in his construction of this element, Dr. Edwards noted that "[a] skilled person would be aware of several readily available software libraries that provide the ability to run just this type of geospatial query, so the skilled person would not need to implement or understand any complex geometric calculations to implement this claim element": Edwards Second Report, para 71.

[448] I therefore find that the GreenStar 3 disclosed and enabled the use of the set of *operating events*, the *travel path*, and the descriptive information on the FOLS stored in memory to determine the *farming operation* occurred on the FOLS.

> (iv) record the farming operation and the descriptive information for the farming operation land segment in the electronic farm record

[449] The final element of Claim 1 means the program stores the information about the *farming operation* and the associated FOLS in the relevant EFR. Mr. Ault opined that the GreenStar 3 discloses that "the farming operation and information about the field it was performed on are then saved in the device's memory": Ault First Report, paras 308, 320(f). Dr. Edwards did not disagree. I am satisfied that this final element was similarly disclosed and enabled in the GreenStar 3.

[450] I conclude that Farmers Edge has met its onus to show that all of the essential elements of Claim 1 were disclosed and enabled in the GreenStar 3 2630 display. Put another way, the POSITA who reviewed the GreenStar 3 2630 and used their CGK to develop a device with its

attributes would “necessarily infringe” Claim 1: *Shire* at paras 44, 50. Claim 1 is invalid for anticipation.

(5) Dependent claims

[451] Mr. Ault describes in his report how the limitations of dependent Claims 3, 4, and 7 to 19 were similarly disclosed and enabled by the GreenStar 3: Ault First Report, paras 259–280, 304–317. Dr. Edwards did not raise any issues in respect of Mr. Ault’s evidence regarding the dependent claims: Edwards Second Report, para 285. Mr. Ault was not cross-examined on this evidence, and Farmobile did not challenge his conclusions related to the additional limitations imposed by the dependent claims. I accept Mr. Ault’s evidence in respect of these dependent claims and find that they are also anticipated by the GreenStar 3, except in respect of Claims 14 and 16.

[452] As noted above, Claims 14 to 16 describe the relationship between the *farming operation land segment* and the boundaries of a CLU. Claim 14 requires the FOLS to correspond with the boundaries of a CLU. Claim 15 requires the FOLS not to correspond with the boundaries of a CLU. Claim 16 requires the FOLS to span the boundaries of two or more CLUs.

[453] It is clear that every field defined within the GreenStar 3 must necessarily meet the requirements of *either* Claim 14 or 15 since it must, by definition, either correspond or not correspond to the boundaries of a CLU. As the POSITA would be aware, Claim 15 would be necessarily infringed by the GreenStar 3 in any location other than the United States, as a CLU is a term coined by the USDA for a standardized database of field boundaries in that country, so

any field outside the US would "not correspond with the boundaries of a CLU": Ault First Report, Appendix A, p 193. I therefore conclude that Claim 15 is necessarily anticipated by the GreenStar 3, even if the user might not necessarily have recognized "what is happening": *Uponor AB v Heatlink Group Inc*, 2016 FC 320 at para 91.

[454] However, I cannot reach the same conclusion about Claim 14 (the FOLS corresponds with the boundaries of a CLU) or Claim 16 (the FOLS spans the boundaries of two or more CLUs). Mr. Ault states that "it was common general knowledge that the fields saved in memory could correspond with a CLU or overlap multiple CLUs, just as with any geospatial polygon" [emphasis added]: Ault First Report, para 315. However, the issue for purposes of anticipation is whether the GreenStar 3 disclosed the elements of the claim, *i.e.*, whether it necessarily infringed those elements. Mr. Ault has not referred to any aspect of the GreenStar 3 that speaks specifically to the relationship between a field and a CLU and thus to a FOLS corresponding to the boundaries of a CLU or overlapping two CLUs. Without disclosure of these possibilities, I conclude the GreenStar 3 does not disclose the essential elements of Claims 14 or 16, and that these claims are not anticipated.

(6) Conclusion on anticipation

[455] The foregoing analysis deals with the specific claim elements, concluding that they are all disclosed and enabled within a single prior device. Given some of Farmobile's arguments, it is perhaps worth taking a step back before concluding on the issue of anticipation.

[456] Farmobile suggests that the GreenStar 3 does not anticipate because it does not solve the interoperability problem and cannot be used with non-John Deere implements that use proprietary messaging. However, the focus of anticipation, as with the focus of other aspects of patent analysis, is on the invention *as claimed*: *Shire* at para 26. The device claims of the '742 Patent do not include essential elements going to interoperability, do not require the ability to parse proprietary messages, do not require more than one *implement profile* or *communication protocol*, and do not require the ability, intention, or possibility of having more than one *implement profile* or *communication protocol*.

[457] It is certainly not clear from the disclosure of the '742 Patent that the inventors believed they were claiming a solution to interoperability issues, particularly as they relate to non-standard or proprietary languages spoken by farming implements. They discuss knowing what virtual terminal object numbers are associated with what operating parameters for an implement (reverse engineering), but do not discuss either deriving such a *communication protocol* or using a *communication protocol* specifically derived from such process as being the solution they are presenting. In any event, to the extent that the inventors intended to claim, as Farmobile now suggests, a device or system that solved issues of interoperability through the use of multiple *implement profiles* with multiple *communication protocols*, including proprietary protocols that had been obtained or reverse engineered, they failed to do so. If this was what they meant to do, which as I say is far from clear, the fact that they did not do so is a self-inflicted wound.

[458] As a result of how the inventors of the '742 Patent chose to draft their claims, a *relay device* whose memory includes a single *implement profile* defining a *manufacturer code*, *device*

class, and *version* for a single *known farming implement*, and whose software conducts a *match* with that *implement profile* by using content from *messages* transmitted on the *message bus* will read on the claim and infringe the patent (providing all other essential elements are present). The result is that the claim is fairly broadly stated and can capture a broader range of devices than if the claims had been more narrowly drafted to specifically claim the particular issues Farmobile now relies on. But broad patent claims also risk capturing prior art devices. If they do, they are invalid. This is the case with the identified device claims of the ’742 Patent, and this invalidity cannot be saved by reference to general notions or asserted benefits not claimed in the claim: *Hospira* at paras 71–74.

[459] I conclude that Claims 1, 3, 4, 7 to 13, 15, and 17 to 19 are invalid as having been anticipated by a prior art device, namely John Deere’s GreenStar 3 2360 display monitor.

C. *Obviousness*

[460] Farmers Edge alleges that all of the claims of the ’742 Patent are invalid for obviousness. I will address those allegations only in respect of those claims I have found not to be anticipated. This is primarily the system claims (Claims 20 to 44), but also includes the remaining device claims (Claims 2, 5, 6, 14, and 16).

[461] For the reasons below, I agree that the claims of the ’742 Patent that are not invalid for anticipation are invalid as being obvious over the prior art in light of the CGK of the POSITA.

(1) Principles

[462] In addition to being novel, the subject-matter of a patent must be inventive, that is, it must not be obvious to a POSITA having regard to the prior art: *Patent Act*, ss 2 (“invention”), 28.3. The parties each referred to the four-step approach to obviousness set out by the Supreme Court of Canada at paragraph 67 of *Sanofi*:

> (1) (a) Identify the notional “person skilled in the art”;
>
> (b) Identify the relevant common general knowledge of that person;
>
> (2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;
>
> (3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed;
>
> (4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

[463] This approach is one way to assess obviousness, but it is not mandatory: *Western Oilfield* at para 109; *Biogen* at para 143. That said, it is a helpful framework and the one the parties used in their arguments, so I will adopt it in my analysis.

[464] The Federal Court of Appeal has clarified a few aspects of the *Sanofi* obviousness analysis in its recent decisions in *Hospira* and *Shire*. In *Hospira*, Justice Locke confirmed that the “state of the art” referred to in step 3 of the *Sanofi* approach is the prior art available to the public, and is not limited either to the CGK [identified at step 1(b)] or to art that would have

been found in a reasonably diligent search: *Hospira* at paras 83–86; *Patent Act*, s 28.3. However, the CGK and issues of findability remain relevant to the question of obviousness at step 4: *Hospira* at para 86.

[465] In *Shire*, Justice Rennie discussed the "inventive concept" of step 2, noting similarities and differences between construing the claims and construing the inventive concept: *Shire* at paras 67–69. He drew from *Sanofi* a two-step approach: first, determine whether the inventive concept can be identified from the claims construction exercise; and second, if it cannot, construe the inventive concept with regard to the patent specification: *Shire* at para 67, citing *Sanofi* at para 77.

[466] As set out above, the claims construction exercise is also undertaken in light of the patent specification as a whole. However, the exercise of claims construction and that of construing the inventive concept remain distinct, despite their "striking resemblance": *Shire* at paras 68, 75; see *Tearlab* at paras 76–78; *Ciba Specialty Chemicals Water Treatments Limited v SNF Inc*, 2017 FCA 225 at para 77. Recognizing a balance similar to that undertaken in claims construction, Justice Rennie recognized that (i) the disclosure may inform the construction of the inventive concept, which is not limited to the essential elements of the claim; but (ii) at the same time, the inventive concept cannot be based on some "generalized concept" from the disclosure, and the disclosure should not be used to construe the inventive concept more narrowly or widely than the text of the claims will allow: *Shire* at paras 67, 69–70, 74.

[467] As is often the case with both claims construction and the inventive concept, the parties stressed different aspects of this balance. Farmers Edge focused on the caution not to import some "generalized concept" from the disclosure, while Farmobile stressed the importance of construing the inventive concept in light of the disclosure. In terms of stating the principles, they are essentially both right. The Court can neither ignore the disclosure nor abandon the claims in construing the inventive concept. In application, the question becomes where the balance lies between appropriately construing the inventive concept of the claims in light of the disclosure and inappropriately importing generalized concepts from the disclosure to unduly expand or contract the inventive concept.

[468] As with assessing anticipation, obviousness must be assessed on a claim-by-claim basis. This includes the assessment of the inventive concept. While a "single inventive concept must flow through a patent, […] each claim's specific inventive concept may be different": *Shire* at paras 55, 77.

[469] When conducting step 4 of the analysis, the key question of obviousness, the issue is whether the uninventive skilled person, given the state of the art and the CGK, but without knowledge of the claimed invention, would have come directly and without difficulty to the claimed invention: *Tearlab* at para 81; *Beloit Canada Ltd v Valmet Oy*, [1986] FCJ No 87 (CA) at para 19. This need not involve an assessment of each piece of prior art separately; rather, the "cumulative effect of the prior art" must be considered: *Tearlab* at para 81. Obviousness is assessed objectively and purposively, having regard to the problem addressed in the patent: *Shire* at para 103.

(2) The POSITA and their CGK

[470] I have identified the POSITA above at paragraphs [49] to [56]. They are a person skilled in designing and building software systems and devices for network communication on, and the collection and processing of data from, agricultural equipment, with skill and experience in both precision agriculture and software and networking communications.

[471] I have also discussed the CGK of the POSITA above at paragraphs [59] to [79]. At the priority date, that CGK included knowledge of precision agriculture and the communications technologies used on modern farming equipment to record and transmit agronomic and other data; knowledge in particular of the ISO 11783 standard published in respect of that communication; and knowledge of the software available and used to process and visualize both data generated during farming and plans for future farming operations, including FMIS systems. Particular aspects of the CGK of the POSITA relevant to the parties' obviousness arguments are discussed further below.

(3) The inventive concept

(a) *The parties' positions on the inventive concept*

[472] The parties presented differing positions on the inventive concept of the claims of the '742 Patent. These positions then affected their respective submissions on the prior art and obviousness in light of that prior art.

[473] Farmers Edge, relying on Mr. Ault's evidence, refers to the two problems identified in the disclosure of the '742 Patent, set out at paragraph [28] above: the lack of an "easy-to-use, unobtrusive, secure and reliable way to capture, store, share and profit from" agronomic data; and concerns about the USDA's CLU system, notably that it does not account for unused farmland. It suggests the POSITA would understand the inventive concept of each claim of the '742 Patent to be a relay device or system that addresses these problems in the specific ways set out in each claim: Ault First Report, paras 18–19, 83–88.

[474] Farmobile adopts Dr. Edwards' articulation of the inventive concept. Dr. Edwards defined the inventive concept of the patent as being "a specific combination of software, hardware, data, and protocols, which together enable a complementary bundle of useful properties: (1) detailed, automatic, and unobtrusive collection of raw farming data; (2) interoperability with the heterogenous computing systems and protocols used in farming equipment; (3) reliable, scalable, and secure storage of collected farming data; (4) interpretation and analysis of the meaning (or "semantics") of collected data; and (5) simple and easy user access to collected data and intuitive presentation of complex analysis results to farmers and third-party users": Edwards Second Report, para 158. Dr. Edwards expands on each of the five properties identified, describing benefits and how they are achieved. For example, in discussing the property (1), he states that data collection is "automatic" in that a user is not required to copy data to a portable storage device or import it into a desktop application: Edwards Second Report, para 161. In discussing property (2), he refers to systems capable of working with a variety of different types of implements of different manufacturers: Edwards Second Report, para 162.

[475] There is some overlap in the experts' descriptions of the inventive concept. Both experts refer to the patent's reference to the need for an easy-to-use, unobtrusive, secure and reliable way to capture, store, share and profit from agronomic data. Both also refer to the specific combination of elements presented in each claim. To some degree, both experts also refer to the concern about identification of unused farmland. Mr. Ault refers to this as part of the second problem identified in the patent, while Dr. Edwards explains his property (5) to include the notions of *operating events*, the *travel path*, and the FOLS: Edwards Second Report, para 166.

[476] The primary difference between the experts' respective views on the inventive concept is in Dr. Edwards' inclusion in his properties, and thus in his definition of the inventive concept, of several terms and other concepts that Farmers Edge argues are not found in the claims and have no place in the inventive concept. These include, importantly, the concept of interoperability, including in particular interoperability with the implements of manufacturers who use proprietary communication protocols. Based on this concept, Farmobile insists that the point of the invention is that an infringing system "must be capable of matching with one of several possible implement profiles." The differences also include issues related to (i) wireless data transfer, which Dr. Edwards identifies as relevant to the terms "detailed" and "automatic"; (ii) reliability and scalability, which Dr. Edwards relates to the use of servers rather than devices in Claims 20 and 38, and which again raise wireless data transfer issues; and (iii) "intuitive" data presentation.

(b) *The inventive concept of the patent and its claims*

[477] In my view, Farmers Edge defines the inventive concept of the claims somewhat too narrowly, while Farmobile seeks to define it far too broadly. Farmers Edge's construes the invention almost exclusively based on the essential elements of the claims, ignoring relevant notions in the disclosure. Farmobile, however, seeks to import a number of "generalized concepts" from the disclosure (and beyond) that have no grounding in the claims and thus in the concept of the invention as claimed.

[478] There are two important clues to what the POSITA would consider the "single inventive concept" flowing through the patent as a whole. The first clue is in the inventors' discussion of the field of the invention and the POSITA's common general knowledge of that field. The inventors expressly recognize that precision farming is well known and that computer systems and onboard technology were used to transmit, receive, and respond to the detailed operational data being generated by farming implements. They also refer to existing computer systems and related technologies, recognizing that it is used to collect and analyze such data (while asserted that it "often goes uncollected"). The inventors are clearly not claiming to have invented devices or systems for the collection and analysis of farming data for precision farming, but a particular computer system and technology. The inventors also refer to the importance of being able to identify and describe the particular field where a farming operation takes place, with reference to the problems about the CLU system. They further discuss the extraction of content from messages transmitted on the message bus based on identifying the implement and knowing the language it uses.

[479] The second clue is the inclusion in every claim of the patent of three particular concepts or elements that correlate to aspects of the discussion described above: (a) using stored information (*manufacturer code*, *device class*, *version*, *communication protocol*) about a "known" implement to automatically recognize the implement being used in farming and know how it communicates data; (b) using data sent by the implement to determine *operating events* and a *travel path*; and (c) automatically identifying the land on which farming is happening. There are other common elements in the claims, including microprocessors, bus connectors, GPS receivers, and storing data that has been collected. These elements are essential, and are involved in implementing the foregoing concepts (*e.g.*, the GPS is also used to determine the *travel path*). However, reviewing the patent as a whole, these other elements appear to be recognized as the usual part of computer technologies for collecting farming data, rather than what is inventive about the claimed devices and systems.

[480] These elements relate directly to the problems the inventors identified in prior art systems. The "easy-to-use" concern is reflected in the automatic recognition of the farming implement and the land where the farming is happening ("secure" appears to relate to the ability to store data through the exchange system, relevant to some claims; "unobtrusive" is less clear, but might relate to the use of an on-board device). The concern about not accounting for untreated farmland is reflected in the *travel path*, while other problems with the CLU system are reflected in the FOLS and the automatic identification of the FOLS.

[481] I thus agree with Dr. Edwards and Farmobile that the awareness that different implements can speak different "languages" is relevant to the patent and the inventive concept, given the

presence in the claims and the disclosure of the *communication protocol* and the identification of the particular *farming implement* being used. The importance of conducting that identification automatically, rather than manually, is also clear from the presence in the claims of a way in which to do that using the software contained in the device or system. However, I disagree that the inventive concept relates to enabling interoperability, and in particular interoperability with machines that speak proprietary languages.

[482] As discussed above at paragraphs [193] to [204] in the context of claims construction, the patent does not discuss interoperability as being the particular issue it is trying to address. It refers generally to other difficulties with prior art systems, but does not refer to them being unable to understand multiple languages or to connect to multiple implements. It refers to collections of communication profiles as a potential embodiment, and to reverse engineering languages, but neither claims it nor identifies it as the particular benefit or advantage of the invention. In order to conclude that an "advantage" not found in the claims is part of the inventive concept, one ought to at least be able to find discussion of that advantage in the disclosure: *Shire* at paras 74, 79–84. Further, even if there were discussion of interoperability, the inventive concept must be tied to elements of the claims, even if it is not limited to them: *Shire* at paras 26, 70–74. Construing the inventive concept based on an aspect of the disclosure that is very clearly and expressly *not claimed* would be to define an inventive concept of the patent more amorphously, rather than the inventive concept of the claims, as is required by *Sanofi*.

[483] As a result, Farmobile's rhetorical question, based on *Beloit*, as to "why the solution to the issue of interoperability disclosed and discussed in the 742 Patent was not solved by others at the relevant time" is based on a mistaken premise. The '742 Patent does not discuss the issue of interoperability, and certainly does not present its device as a solution to it. Indeed, it is far from clear that the claimed devices and systems of the '742 Patent constitute a solution to problems of interoperability, as they do not claim a requirement for multiple *communication protocols*, let alone the use of proprietary ones.

[484] I do agree with Farmobile that certain aspects of data collection and analysis are relevant to the inventive concept, including the *travel path*. A *travel path* might be considered an aspect of "intuitive presentation of analysis results," as Dr. Edwards describes it, although only some claims of the '742 Patent involve data display (Claims 12, 36, 39, and 42), and the '742 Patent distinguishes between the *travel path* and a "map representing the *travel path*." Regardless, I agree with Farmers Edge that other aspects of the "intuitive presentation of analysis results" that Dr. Edwards describes—including the ability to view data through a mobile device or web browser, switch computers without transferring data, and generate revenue by sharing data—are unrelated to the claims as drafted and are not part of the inventive concept of the claims.

[485] Also unrelated to the inventive concept of the patent claims as a whole are the additional aspects of the "automatic" collection of data Dr. Edwards describes, such as being able to transfer data without using a portable storage device. Only Claim 13 requires a *data communications channel* for this purpose, and the'742 Patent expressly refers to data transfer by portable storage such as a memory stick: Ault Third Report, para 61. The ability to transfer data

without a portable storage device may be part of the inventive concept of Claim 13, but not other claims.

[486] Based on the foregoing, I conclude that the single inventive concept running through the claims of the ’742 Patent is computer technologies for collecting and processing agronomic data involving (a) the use of stored information (*manufacturer code*, *device class*, *version*, *communication protocol*) about a “known” implement to automatically recognize the farming implement being used and know how it communicates data; (b) the use of data sent by the implement to determine *operating events* and a *travel path*; and (c) the automatic identification of the land on which farming is happening.

[487] The specific inventive concept of each claim then lies in the specific manner (hardware, software, data storage, and processing) of implementing the broader inventive concept. Thus, the specific inventive concept of Claim 1 is a relay device for collecting and processing agronomic data, designed to be connected to the message bus on farming equipment, that (a) uses stored information (*manufacturer code*, *device class*, *version*, *communication protocol*) about a “known” implement to automatically recognize the farming implement being used by determining a *match* with the stored information and thereby know how the implement communicates data; (b) uses data sent by the implement to determine *operating events* and a *travel path*; and (c) automatically identifies the land on which farming is happening with reference to stored land information.

[488] Similarly, the specific inventive concept of independent Claim 20 is a computer system for collecting and processing agronomic data, located remotely from a relay device connected to farming equipment, that (a) uses stored information (*manufacturer code*, *device class*, *version*) about a "known" implement to automatically recognize the farming implement being used by determining a *match* with the stored information and thereby know how it communicates data; (b) uses data sent by the implement to determine *operating events* and a *travel path*; and (c) automatically identifies the land on which farming is happening with reference to stored land information.

[489] The specific inventive concept of independent Claim 38 is a computer system for collecting and processing agronomic data, located remotely from a device connected to farming equipment, that (a) uses stored information (*manufacturer code*, *device class*, *version*, *communication protocol*) about a "known" implement to automatically recognize the farming implement being used and know how it communicates data; (b) uses data sent by the implement to determine *operating events* and a *travel path*; and (c) automatically identifies the land on which farming is happening using data sent by the farming implement; that also includes a *farm traffic controller* for receiving and storing the agronomic data produced by the remote relay device.

[490] The various dependent claims similarly have specific inventive concepts that incorporate the specific elements of the device or system components introduced in the dependent claims. These are discussed further below.

(4) The state of the art

[491] Farmers Edge presents and relies on a number of pieces of prior art as reflecting the state of the art. These include the GreenStar 3 display discussed above and the ISO 11783 standard. They also include other commercial precision agriculture systems and FMIS products, such as the Case Pro600 monitor, Ag Leader SMS, and FarmWorks; articles discussing the collection and processing of agronomic data, including G Steinberger et al, "Mobile farm equipment as a data source in an agricultural service architecture" (2009) 65 Computers and Electronics in Agriculture 238 [Steinberger], and H Auernhammer, "The Role of Mechatronics in Crop Produce Traceability" (2002) Agricultural Engineering International, Vol. IV; and patents, including GH Hale, "Automatic identification of field boundaries in a site-specific farming system," US 5,978,723 (Nov 2, 1999) [Hale].

[492] With respect to the Ag Leader SMS FMIS system, Mr. Ault gave evidence based on his own personal experience with the software prior to 2013. He presented example maps and displays based on historical data recorded on his farm, captured from a September 16, 2013 version of the Ag Leader SMS software, as well as information from tutorial videos posted before the priority date: Ault First Report, paras 135–151; Edwards Second Report, paras 28–30, 33, 471–484; Ault Third Report, paras 76–79, Appendix A; Edwards Fourth Report, paras 37–39, 54; Transcript, Day 8, pp 79–89. There is no indication that Mr. Ault's personal experience with the Ag Leader SMS software was different than that of other users, and I accept that his own experience reflects the known state of the art.

[493] Mr. Ault's evidence shows that at the priority date, the Ag Leader SMS software could use data generated by farming implements and sent over the message bus, together with associated GPS data, to generate various analytical maps of farms, including "as-applied" and "as-harvested" maps. Using data from the implement, the "as-applied" maps would show areas where, for example, no seed was planted. It could also use these maps to generate field boundary maps defining the area of a field, and/or could sort new data based on previously defined field boundaries. The Ag Leader SMS software could use data collected and recorded on various devices on farming equipment, including Ag Leader's own monitors or the Case Pro600 display Mr. Ault used. This data could be conveyed by thumb drive, as Mr. Ault did at the time. As of September 2013, Ag Leader had announced a future capability to send and receive data files wirelessly from the cab of the farming implement to its new cloud based platform, although this feature was not launched until 2014.

[494] Given my conclusions regarding the GreenStar 3 and the evidence regarding the Ag Leader SMS software, I need not address in detail other aspects of the prior art set forth as the state of the art.

(5) Differences between the state of the art and the inventive concept

(a) *The single inventive concept flowing through the patent*

[495] As set out above in my discussion of anticipation and the GreenStar 3, I conclude that the state of the art included computer technologies involving (a) the use of stored information (*manufacturer code*, *device class*, *version*, *communication protocol*) about a "known" implement

to automatically recognize the farming implement being used and know how it communicates data; (b) the use of data sent by the implement to determine *operating events* and a *travel path*; and (c) the automatic identification of the land on which farming is happening. There was no difference between the state of the art and the general inventive concept running through the ’742 Patent.

[496] In this regard, Farmobile argues that the key differences between the prior art and the ’742 Patent are that no piece of prior art disclosed (a) a *communication protocol* associated with an *implement profile*; or (b) matching *messages* or *message data* from an implement performing a farming operation and an *implement profile* associated with a *communication protocol* for the purpose of understanding messages being sent by the implement that performs a farming operation: Farmobile Responding Submissions, para 98. I have explained above in discussing the GreenStar 3 why I disagree with this submission. The differences Farmobile identifies were disclosed in the GreenStar 3.

[497] I also note that Farmobile’s arguments seeking to distinguish prior art such as Steinberger and Hale on the basis that they do not accommodate proprietary *communication protocols* are misplaced, for the reasons I have given above. In any event, I agree with Mr. Ault and Farmers Edge that Dr. Edwards’ evidence regarding the obviousness of associating a known proprietary language (*e.g.*, one that has been reverse engineered) with a *known farming implement* conflicts with the evidence regarding both the state of the art and the common knowledge.

[498] As Dr. Edwards agreed, part of the POSITA's common knowledge would have been the ability to reverse engineer the *communication protocol* of a farming implement that uses proprietary messages. The very purpose of doing so would be to have (and store) that *communication protocol* to be able to understand the farming implement when it was connected to a message bus and sending agronomic data. The POSITA's general knowledge also included the fact that all farming implements using the ISOBUS 11783 standard—*i.e.*, almost all equipment produced since 2005, including those using proprietary *communication protocols*—sent an address claim message including the NAME field upon connection to the message bus to identify itself. Storing a farming implement's *communication protocol* in association with the implement's identity information was not just obvious. It was known and done in the art, including in the GreenStar 3. Even if doing so with a proprietary, reverse engineered, protocol were part of the inventive concept of the '742 Patent, which it is not, and even if it were not previously disclosed, it was obvious to the POSITA to do the same thing with a proprietary protocol that was done with non-proprietary protocols.

(b) *The specific inventive concepts of the claims*

[499] The next question is what the differences are between the state of the art and the specific inventive concepts of the claims asserted to be obvious.

[500] Mr. Ault identified two differences between the state of the art and the inventive concepts of the particular claims: (a) Claims 2, 21-25, and 40 have as part of their specific inventive concept conducting the step of matching the *farming implement* that is farming with the *known farming implement* of the *implement profile* using the virtual terminal object pool version in

particular; and (b) Claims 5, 6, 22, and 23 have as part of their specific inventive concept including a known set of virtual terminal object IDs in the *implement profile* and using them to obtain operating parameters and determine operating events: Ault First Report, paras 347–351; Farmers Edge Closing Submissions, para 49.

[501] I would add to this list two other relevant differences: (c) the system claims (Claim 20 and above) have a different architecture than prior devices or FMIS systems, in that all of the processing of data, including the recognition of the implement to know its language, and determining operating events and travel path, is performed in a system that is remote from the relay device; and (d) Claims 14, 16, and 28 to 30 include specific inventive concepts related to the boundaries of a CLU, as discussed above. I note that Farmers Edge implicitly recognizes the first of these additional differences, as it argues that changing the location of message parsing would have been obvious: Farmers Edge Closing Submissions, paras 52–53.

[502] Farmobile does not identify any other differences between the state of the art and the specific inventive concepts of the claims.

(6) The differences would have been obvious to the POSITA at the priority date

(a) *matching using the virtual terminal object pool version*

[503] The *match* in Claims 2, 21, and 40 (as well as Claims 22 to 25, which depend from Claim 21) involves matching the *manufacturer code* and *device class* from the farming implement with the *manufacturer code* and *device class* in the *implement profile*, and further

matching the version in an *object pool version message* (*i.e.*, the virtual terminal object pool version) with the *version* in the *implement profile*. It therefore requires the use of information beyond the NAME field for the match, and in particular information from a Get Version message.

[504] Mr. Ault's evidence was that the POSITA would have known that there were four sources of message data: fully standardized messages; task controller messages; virtual terminal object ID messages; and proprietary messages: Ault First Report, paras 123, 348. The discussion in the disclosure of the '742 Patent focuses on using virtual terminal object ID messages as the source of operating parameters. For example, its discussion of *communication protocols* refers to a mapping between operating parameters and virtual terminal object numbers. While standardized messages and task controller messages are better sources of information, the POSITA would know that the "next best source of information" is from reverse engineering virtual terminal object ID messages that contain machine data. Mr. Ault identifies commercially available software used for this purpose: Ault First Report, para 348.

[505] The POSITA would also have known that implements may have different virtual terminal object pool versions, and that different implements of the same type might tell the virtual terminal to load different versions through the Get Version message: Ault First Report, para 350. As a result, in order to get comprehensible data from the implement, it is necessary to match the virtual terminal object pool version from the Get Version message with a known virtual object pool version. In Mr. Ault's view, it would therefore have been obvious to the POSITA based on their CGK to undertake such a match, since it is "inherent in ISO11783 itself" and would have

been part of the CGK of the POSITA: Ault First Report, para 351. In other words, to the extent that a POSITA uses their CGK regarding reverse-engineering a *communication protocol* based on virtual terminal object pool IDs, one of the four sources of *operating parameter* information, they would know that they would have to *match* the virtual terminal object pool version of the *farming implement* to ensure the system was speaking the same language as the implement.

[506] Dr. Edwards did not contest Mr. Ault's views with respect to the obviousness of this limitation over the subject-matter of Claim 1. While he disagreed with Mr. Ault's statements regarding the differences between these claims and the prior art, he did not contest that the particular limitations dealing with matching using the virtual terminal object pool version were obvious: Edwards Second Report, para 175. Nor does Farmobile raise any arguments with respect to Mr. Ault's evidence on this particular issue.

[507] I am satisfied based on Mr. Ault's evidence that the POSITA would consider conducting matching a *farming implement* to a known *farming implement* in an *implement profile* using both the *manufacturer code* and *device class* on the one hand and the virtual terminal object pool version on the other to be obvious.

(b) *using virtual terminal object IDs to determine operating events or operating parameters*

[508] Claims 5, 6, 22, and 23 include in their specific inventive concept a particular aspect of using a *communication protocol* to understand the information sent by an implement, namely

defining in the *implement profile* a known set of *operating events* (Claims 5 and 22) or *operating parameters* (Claims 6 and 23) for a known set of virtual terminal object IDs.

[509] Mr. Ault's evidence and explanation with respect to this limitation overlapped with that related to the prior limitation, given the relationship between the virtual terminal object pool version and the virtual terminal object IDs: Ault First Report, paras 347–351. Again, neither Dr. Edwards nor Farmobile contested this aspect of Mr. Ault's evidence. I accept it for the same reasons set out above and conclude the POSITA would consider including these limitations in a device or system to be obvious.

(c) *off-device architecture*

[510] The system claims of the '742 Patent pertain to systems that have a different overall architecture than the device claims. In the device claims, all of the storage and data processing is present on the device. In the system claims, all of the storage and data processing is remote to the device. I have discussed above at paragraphs [235] to [259] my reasons for concluding that the location of storage and data processing is an essential element of both the device claims and the system claims. Given that the primary distinction between the device claims and the system claims is where the information is stored and processed, I consider the location of the storage and processing on a system remote to the device to be part of the inventive concept of the system claims: Edwards Fourth Report, paras 5(4), 33–36.

[511] Farmers Edge has identified a prior art device in which all of the claimed storage and data processing is present on the device, namely the GreenStar 3. It has not identified a prior art

system in which all of the claimed storage and data processing is remote to the device. Prior art FMIS systems such as Ag Leader SMS stored farm records, and descriptive information about fields, and could use data to determine operative events, create "as-applied" maps, and determine where farming operations occurred: Ault First Report, paras 237–250, 341, 344; Ault Second Report, paras 77–79, Appendix A; Transcript, Day 8, pp 79–89. However, they used data that had already been parsed by the remote device, rather than receiving raw data from the remote device and undertaking the parsing step at the system level: Edwards Second Report, paras 289(e), 505(e), 512; Transcript, Day 3, pp 52–55.

[512] The location of storage and processing entirely off the device—in particular, the parsing steps of matching the implement to identify its *communication protocol* and extracting message content in accordance with that protocol—is therefore a difference between the inventive concept of the system claims and the state of the art. For the following reasons, I conclude this difference would have been obvious to the POSITA at the priority date.

[513] As Dr. Edwards and Mr. Ault agreed, the POSITA looking to design a precision agriculture system would know as part of their CGK that design decisions had to be made regarding where storage and processing occurs: Ault First Report, para 342; Edwards Second Report, para 534; Edwards Sixth Report, paras 99–100; Transcript, Day 8, pp 121, 158.

[514] In his initial report on validity, Dr. Edwards conceded that moving the task of extracting content from an in-cab monitor or task controller to a server by transferring raw data from the device instead of parsed data was "not on its face inventive": Edwards Second Report, para 512.

However, he argued that prior art systems avoided and even disparaged such an approach, because (a) the ISO 11783 standard teaches that messages should be processed on a task controller before being transmitted to an FMIS; (b) the legacy of in-cab monitors would have created a natural bias towards a similar architecture; and (c) cellular network bandwidth was historically expensive and unreliable, while USB stick data transfers were tedious, such that maximal processing before data transfer was preferable.

[515] Although Dr. Edwards in his evidence referred to the Ag Leader SMS software as processing parsed data rather than conducting the parsing itself, he did not discuss the location of processing on the server as an inventive difference and did not refer to the evidence from his First Report discussed above. To the contrary, he pursued the contrary line of argument, raised in his later reports, that the POSITA would know that computational functions could be done anywhere and, indeed, that it was preferable to process data *off* the edge device: Transcript, Day 3, pp 9–10, 26–28. For example, in Dr. Edwards' Fifth Report, dealing with infringement by the CanPlug, he asserted that processing messages on the device and only sending parsed messages instead of raw data (a) limited the ability to reprocess previously collected raw data messages; (b) imposed a restriction on how much raw data could be retained in storage for how long; and (c) created a single point-of-failure that is vulnerable to data loss: Edwards Fifth Report, paras 127–129. This is in stark contrast to his initial opinion that the POSITA would have been motivated toward keeping the parsing of raw data on the device.

[516] As discussed above, Dr. Edwards opined in his Sixth Report that it would be obvious to the POSITA that moving storage and processing to a server would not make a difference to how

the invention worked, noting expressly that it was "functions and designs" of the system, not the location of the processing, that were novel: Edwards Sixth Report, paras 91–95. While he was dealing in particular with the post-parsing data analysis in elements 1(d)(ii), 1(e)(iii), and 1(e)(iv), he asserted as a general matter that "offloading processing from an embedded device was a common design technique," and that trends in computing capitalized on growing network connectivity and cloud computing to improve data processing capabilities: Edwards Sixth Report, para 99; see also Edwards Seventh Report, paras 12–13. Perhaps in light of this evidence, Farmobile did not argue in its closing submissions that having the storage and processing at the system level rather than on a device was itself an inventive difference from the prior art.

[517] Dr. Edwards' later evidence severely undermines the reliability of his earlier assertions that the POSITA would have been motivated to keep processing functions on an edge device rather than having them performed on a server. Indeed, on this point, Dr. Edwards appears to have been willing to state two effectively contrary assertions when they served his arguments, or those of Farmobile.

[518] In addressing essentiality above, I rejected Dr. Edwards' assertion that it would be obvious to the POSITA that a system in which processing was moved off a device onto a server would work "in the same way." Rather, the POSITA would know that moving data processing functions would make a difference to the way the system works. However, this does not mean that it would not be obvious to the POSITA that such a system would work. To the contrary, the POSITA would know that storage and computational functions that are run on a processor on an

edge device, such as the matching and parsing functions on the GreenStar 3, could also be run on a server, for example as part of an FMIS software system. The choice of where to put them would result in programming decisions, but such programming would be within the skill of the POSITA and would require no inventive ingenuity.

[519] I therefore conclude that the difference between the state of the art of conducting the matching and data extraction steps on a device and the system claims of the ’742 Patent in which they occur remote to the device would have been obvious to the POSITA.

[520] I also conclude in respect of Claims 21 to 25 and 40, that it would have been obvious to the POSITA to use virtual terminal object pool versions to match and, as a related matter, to use virtual terminal object IDs to determine operating events or parameters, on a system in which these steps are remote from the device. The two issues—what inputs are used for data matching and extraction, and where such functions occur—appear to be independent. No party suggested that the former could or would be considered to only be possible on a device, or even that the POSITA would be motivated to keep such functions on a device if this particular approach to matching and data were taken. There would be no inventive ingenuity required for the POSITA to use virtual terminal object pools and IDs, to move all storage and processing off the device, or both.

(d) *common land unit*

[521] Claims 14 to 16 and 28 to 30 add limitations related to the relationship between a FOLS and a CLU. I have concluded that Claim 15, which requires the FOLS not to correspond to the

boundaries of a CLU, falls within the prior art and is anticipated. For the same reason, Claim 29, which adds the same limitation to the system of Claim 20, is obvious. A system of Claim 20, which is obvious, would necessarily include a FOLS that does not correspond with the boundaries of a CLU any time it was used outside the United States.

[522] The specific inventive concept of Claims 14 and 28 includes having a FOLS that corresponds to a CLU. The specific inventive concept of Claims 16 and 30 includes having a FOLS that spans the boundaries of two or more CLUs.

[523] The experts agreed that the CGK of the POSITA included the USDA's CLU system: Ault First Report, Appendix A, pp 193, 196–197; Edwards Second Report, paras 108–112. Mr. Ault's opinion was that "it was common general knowledge that the fields saved in memory could correspond with a CLU or overlap multiple CLUs, just as with any geospatial polygon": Ault First Report, para 315, Appendix A, pp 196–197. He further opined that it would have been obvious to the POSITA that functionality related to the CLU could be performed at the system level as opposed to the device: Ault First Report, Appendix A, pp 209–209. Dr. Edwards did not contest this, and neither party called any further evidence or argument on the CLU issue, beyond Mr. Tatge's discussion about how the issue arose to his attention while at Crop Ventures and its potential implications of the CLU system for the industry: Transcript, Day 2, pp 25–26, 110–111; Exhibit 22.

[524] I am satisfied based on Mr. Ault's evidence that it would have been obvious to the POSITA, with their knowledge of the USDA CLU system, to ensure that any precision

agriculture device or system permitted a FOLS to coincide with, not coincide with, and/or overlap a CLU. No inventive step would be required to include this in such a device or system.

(7) Conclusion on obviousness

[525] For the foregoing reasons, I conclude that the differences between the state of the art and the inventive concept—both the general inventive concept running through the ’742 Patent and the specific inventive concepts of all of the claims that are not anticipated—constitute steps that would have required no degree of invention and thus would have been obvious to the POSITA without any knowledge of the ’742 Patent. These claims are invalid for obviousness.

[526] As a result of the foregoing conclusions that all of the claims of the ’742 Patent are invalid on the basis of anticipation or obviousness, I need not address Farmers Edge’s other invalidity arguments.

VI. Motion to Reopen

[527] While this decision was under reserve, Farmobile (by then, AGI Suretrack) filed a motion for an order requiring Farmers Edge to serve a further affidavit of documents and re-attend for examination, and to re-open the trial to permit the parties to file further evidence. The motion was based on allegations that Farmers Edge had produced evidence in parallel litigation in Nebraska that had not been produced in Canada. The evidence relates to (a) the location of Farmers Edge’s servers, (b) the estimated number of acres being served by Farmers Edge, and (c) certain agreements regarding satellite services. Farmobile alleged the evidence in the first

category was relevant to issues argued at trial regarding extraterritoriality, while the latter two were relevant to the claimed reasonable royalty in the event of a finding of infringement.

[528] Farmers Edge opposed the motion, asserting that all of the evidence was either irrelevant, evidence that Farmobile knew or should have known about, or evidence that would not impact the outcome, or all three. It argued that the test to reopen trial set out by the Supreme Court of Canada had not been met: *671122 Ontario Ltd v Sagaz Industries Canada Inc*, 2001 SCC 59 at paras 59–65. It proposed that, if the motion were not dismissed forthwith, the Court's decision on the motion should be reserved pending this judgment. Farmobile did not agree with the latter suggestion, contending that any judgment rendered on all issues without a complete record, even in *obiter*, would necessarily be tainted.

[529] As is clear from these paragraphs, I decided to reserve decision on Farmobile's motion pending this judgment.

[530] In *Sagaz*, the Supreme Court approved and adopted the test for reopening a trial from *Scott et al v Cook et al*, 1970 CanLII 331 (ONSC). The Supreme Court concluded that to reopen a trial to admit new evidence, two criteria had to be met: (1) the evidence, if presented at trial, would probably have changed the result; and (2) the evidence could not have been obtained before trial by the exercise of reasonable diligence: *Sagaz* at paras 59, 65.

[531] *Sagaz*, like *Scott*, was decided in the context of a motion to reopen trial after reasons were released but before an order was entered: *Sagaz* at para 1. This has led this Court in some cases

to conclude that *Sagaz* may not strictly apply to a motion brought after close of trial but before a decision is issued: *Sanofi-Aventis Canada Inc v Apotex Inc*, 2009 FC 294 at paras 8–11 (motion before final argument); *Varco Canada Ltd v Pason Systems Corp*, 2011 FC 467 at paras 16–22 (motion after final argument, before decision). In *Varco*, Justice Phelan asked himself whether "the evidence, if it had been presented, [could] have had any influence on the result": *Varco* at paras 17, 23. At the same time, in other cases, including recently, this Court has applied the *Sagaz* test without modification, despite the motion having been brought before decision: *Rovi Guides, Inc v Videotron Ltd*, 2021 FC 19 at paras 16–18 (motion before final argument, apparently without the benefit of *Sanofi-Aventis* or *Varco*); *Fromfroid SA v 104587 Ontario Inc*, 2023 FC 925 at paras 114–116 (motion after final argument, before decision).

[532] In the present case, my decision on the merits is based on issues of construction, infringement, and validity. I have not needed to address the issue of territoriality in addressing infringement, or the question of monetary remedies. The new evidence raised by Farmobile cannot possible have affected the result, regardless of any other issues regarding its relevance or earlier discoverability. Nor have I chosen to address the territoriality or remedy issues in *obiter*, such that Farmobile's concern about tainted *obiter* does not arise.

[533] In the circumstances, given my decision on the merits, this is sufficient to conclude that the motion should be dismissed. In the circumstances, no costs of the motion are awarded.

VII. Disposition and Costs

[534] For the foregoing reasons, I conclude that Farmobile has not established that Farmers Edge has infringed any claim of the ’742 Patent. Farmobile’s action is dismissed. Farmers Edge has established that each claim of the ’742 Patent is invalid, either for anticipation or for obviousness. Farmers Edge’s counterclaim for declarations to this effect is granted. Farmers Edge’s counterclaim for an order pursuant to section 52 of the *Patent Act* that the records of the Patent Office be varied to recognize Mr. Osborne as an inventor of the ’742 Patent was abandoned at trial and is dismissed.

[535] The parties shall, within 20 days of the date of this decision, meet and confer in a genuine effort to resolve the issue of costs. If they are unable to do so, they may make written submissions on costs in accordance with the following schedule:

- within 40 days of the date of this decision, Farmers Edge may file submissions not to exceed 15 pages, to which it may attach a bill of costs as an appendix;
- within 20 days of receipt of Farmers Edge’s submissions, AGI Suretrack may file submissions not to exceed 15 pages, to which it may attach as an appendix a bill of costs and/or a submission, not to exceed two pages, addressing specific line items in Farmers Edge’s bill of costs (if filed); and
- within 10 days of receipt of AGI Suretrack’s submissions, Farmers Edge may file reply submissions not to exceed 5 pages.

[536] If the parties require additional time to discuss and agree on costs or to make submissions on costs, they may file an informal request to this effect in letter format.

[537] This proceeding is the subject of a confidentiality order issued pursuant to Rule 151 of the *Federal Courts Rules*. These reasons are being released to the parties on a confidential basis to allow them to identify any confidential information they consider should be redacted before releasing the public version.

JUDGMENT IN T-449-17

THIS COURT'S JUDGMENT is that

1. The plaintiff's action is dismissed.
2. The defendant's counterclaim is granted in part.
3. Claims 1, 3, 4, 7 to 13, 15, and 17 to 19 of Canadian Patent 2,888,742 are declared to be and to have always been invalid and void as claiming subject-matter that was previously disclosed, contrary to section 28.2 of the *Patent Act*.
4. Claims 2, 5, 6, 14, 16, and 20 to 44 of Canadian Patent 2,888,742 are declared to be and to have always been invalid and void as claiming subject-matter that would have been obvious on the claim date to a person skilled in the art or science to which the patent pertains, contrary to section 28.3 of the *Patent Act*.
5. The plaintiff's motion to re-open the trial is dismissed, without costs.
6. The parties shall, within 20 days of the date of this decision, meet and confer in a genuine effort to resolve the issue of costs. If they are unable to do so, they may make written submissions on costs in accordance with the schedule given in the reasons.

"Nicholas McHaffie"
Judge

FEDERAL COURT

SOLICITORS OF RECORD

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