

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

HEADWATER PARTNERS II LLC,	§	
<i>Plaintiff and Counterclaim-Defendant,</i>	§	
	§	
vs.	§	
	§	Case No. 2:24-cv-00015-JRG-RSP
T-MOBILE USA, INC. AND SPRINT LLC,	§	(Lead Case)
<i>Defendants and Counterclaimant-Plaintiffs.</i>	§	Jury Trial Demanded
	§	
	§	
	§	
	§	
HEADWATER PARTNERS II LLC,	§	
<i>Plaintiff and Counterclaim-Defendant,</i>	§	
	§	
vs.	§	
	§	Case No. 2:24-cv-00016-JRG-RSP
AT&T SERVICES, INC., AT&T MOBILITY	§	(Member Case)
LLC AND AT&T CORP.,	§	Jury Trial Demanded
<i>Defendants and Counterclaimant-Plaintiffs.</i>	§	
	§	
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	§	
HEADWATER PARTNERS II LLC,	§	
<i>Plaintiff and Counterclaim-Defendant,</i>	§	
	§	
vs.	§	
	§	Case No. 2:24-cv-00007-JRG-RSP
CELLCO PARTNERSHIP, D/B/A VERIZON	§	(Member Case)
WIRELESS, AND VERIZON CORPORATE	§	Jury Trial Demanded
SERVICES GROUP INC.,	§	
<i>Defendants and Counterclaimant-Plaintiffs.</i>	§	
	§	

DEFENDANTS' INITIAL INVALIDITY CONTENTIONS

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I. INTRODUCTION

Pursuant to the Court’s Docket Control Order in the above-captioned case (Dkt. 42 at 4),¹ Defendants T-Mobile USA, Inc. and Sprint LLC (collectively, “T-Mobile”); AT&T Services, Inc., AT&T Mobility LLC and AT&T Corp. (collectively, “AT&T”), and Cellco Partnership, d/b/a Verizon Wireless, and Verizon Corporate Services Group Inc. (collectively, “Verizon”) (collectively, “Defendants”) serve these Invalidity Contentions (“Contentions”) on Plaintiff Headwater Partners II LLC (“Headwater”) for U.S. Patent Nos. 9,094,868 (the “’868 Patent”)² and 9,413,502 (the “’502 Patent”)³ (collectively, “Asserted Patents”). These Contentions are based on Defendants’ current knowledge of the Asserted Patents and prior art, along with its understanding of Headwater’s infringement allegations set forth in its March 18, 2024 Disclosure of Asserted Claims and Infringement Contentions to T-Mobile and Disclosure of Asserted Claims and Infringement Contentions to AT&T (collectively, “Infringement Contentions”). Based on Headwater’s Infringement Contentions, Headwater is asserting the following claims against each Defendant (collectively, the “Asserted Claims”):

<u>Asserted Claims of ’868 Patent</u>	<u>Asserted Claims of ’502 Patent</u>
1-34	1-46

Defendants submit these Contentions without waiving any arguments about the sufficiency or substance of Headwater’s Infringement Contentions, and without waiving any challenges to

¹ Unless indicated otherwise, docket citations throughout these Invalidity Contentions refer to Civil Action No. 2:24-cv-00015-JRG-RSP (E.D. Tex.).

² The ’868 Patent and its file history have been produced at Bates Nos. [DEF_0006995-7043] and [DEF_0007442-7668], respectively.

³ The ’502 Patent and its file history have been produced at Bates Nos. [DEF_0007044-7094] and [DEF_0007095-7441], respectively.

Headwater's apparent claim constructions. Each cited prior art reference listed below anticipates and/or renders obvious the Asserted Claims of the Asserted Patents, as described below and in the associated claim charts, attached hereto and incorporated by reference as if fully set forth herein.

Identifying these items of prior art and other defenses in connection with these Contentions does not serve as an admission that any alleged accused instrumentalities, including any current or past version of them, is covered by, or infringes any of the Asserted Claims, particularly when the Asserted Claims are properly construed. Further, Defendants' Contentions reflect Defendants' current knowledge and contentions as of this early date in this action. Defendants' Contentions are based on its present understanding and/or Headwater's apparent understanding of the Asserted Claims at this early stage of the case. Accordingly, Defendants' Contentions (including the attached claim charts) may reflect, to the extent possible, Headwater's expected alternative and potentially inconsistent positions as to claim construction and claim scope. Defendants' Contentions should not be construed as an admission regarding the proper construction of any asserted claim, should not be deemed to represent or limit the claim constructions that Defendants will advance in this action, and should not be deemed to relate to the non-infringement positions that Defendants may advance in this action.

Defendants reserve the right, to the extent permitted by the Court and the applicable statutes and rules, (1) to modify and supplement, without prejudice, these Contentions, (2) to raise additional prior art and invalidity defenses not included in these Contentions, including those based on additional discovery or other issues raised by Headwater in this action or any related action, and (3) to amend these Contentions should, for example, Headwater provide any information that it failed to provide in its Initial Disclosures and/or its Infringement Contentions. Defendants further incorporate by reference and reserve the right to rely on the invalidity contentions and related

disclosures served on Headwater by other parties against whom Headwater has asserted the Asserted Patents, or any other patent related thereto.

Further, because discovery has only recently begun, Defendants reserve the right, to the extent permitted by the Court and the applicable statutes and rules, to revise, amend, and/or supplement the information provided herein, including identifying and relying on additional prior art references should Defendants' further search and analysis yield additional information or references, consistent with the Local Patent Rules and the Federal Rules of Civil Procedure. Defendants also reserve the right, to the extent permitted by the Court and the applicable statutes and rules, to rely on witness testimony about the prior art references identified below to supplement these Contentions, where appropriate, and to revise its ultimate Contentions concerning the invalidity of the Asserted Claims, which may change depending upon the Court's construction of the Asserted Claims, any findings as to the priority dates of the Asserted Claims, and/or positions that Plaintiff or its fact or expert witness(es) may take concerning claim construction, infringement, and/or invalidity issues.

The accompanying invalidity claim charts list specific examples of where prior art references disclose, either expressly or inherently, each limitation of the Asserted Claims and/or examples of disclosures in view of which a person of ordinary skill in the art at the time each of the alleged inventions was made, would have considered each limitation, and therefore the claim as a whole, anticipated or obvious. The references, however, may contain additional support upon which Defendants may rely that is not specifically identified in these contentions. The citations included in each chart are intended to be illustrative, not exhaustive. For any given quotation or excerpt, for example, Defendants reserve the right to introduce other text and images (including but not limited to surrounding, related, or explanatory text, images, or un-cited portions of the prior

art references) from the same or other prior art references that may help to provide context to the quotation or excerpt. Furthermore, where Defendants cite to a particular figure in a reference, the citation should be understood to encompass the caption and description of the figure and any text relating, in any manner, to the figure. Similarly, where Defendants cite to particular text referring to a figure, the citation should be understood to include the corresponding figure as well. Defendants may also rely on other documents and information, including cited references and prosecution histories for the Asserted Patents or any related patents (including without limitation any other related patents and/or patent applications, including non-U.S. counterpart patents and/or applications), and witness testimony, including expert testimony, to explain, amplify, illustrate, demonstrate, provide context or aid in understanding the cited portions of the references.

II. P.R. 3-3(a): IDENTIFICATION OF PRIOR ART

Pursuant to Local Patent Rule 3-3(a), and subject to Defendants' reservation of rights, the Asserted Claims of the Asserted Patents are anticipated and/or rendered obvious by the prior art identified below and as reflected in the attached Charts (Appendices A-1 to A-11 and B-1 to B-17). Defendants also contend that the accused instrumentalities do not infringe any Asserted Claim. To the extent, however, that any functionality of the accused instrumentalities is found to infringe any Asserted Claim, those claims are invalid because the accused functionality predates the alleged priority dates of the Asserted Patents.

The following patents and patent publications are prior art to the '868 Patent under either (1) at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g), and/or pre-AIA 35 U.S.C. § 103; or (2) at least post-AIA 35 U.S.C. §§ 102(a)(1) and/or (a)(2), and/or post-AIA 35 U.S.C. § 103:

<u>Table 1</u>			
<u>Chart</u>	<u>Country/Patent Number</u>	<u>Publication/Issue Date</u>	<u>Bates No.</u>
A-1	U.S. Patent No. 6,351,642 ("Corbett")	Feb. 26, 2002 (filed Dec. 22, 1998)	DEF_0001718 - DEF_0001729
A-2	U.S. Patent No. 7,010,320 ("Komatsu")	Mar. 7, 2006 (filed Feb. 16, 2001 (JP))	DEF_0006769 - DEF_0006791
A-3	U.S. Patent No. 8,639,260 ("Fox")	Jan. 28, 2014 (filed Jul. 5, 2011)	DEF_0006792 - DEF_0006847
A-4	U.S. Patent Pub. No. 2004/0017310 ("Vargas-Hurlston")	Jan. 29, 2004 (filed Jul. 24, 2002)	DEF_0006848 - DEF_0006862
A-5	U.S. Patent Pub. No. 2004/017611 ("Wilhelm")	Sept. 9, 2004 (filed Mar. 5, 2003 (EP))	DEF_0006863 - DEF_0006872
A-6	U.S. Patent Pub. No. 2008/0248822 ("Jarvinen")	Oct. 9, 2008 (filed Jun. 13, 2007)	DEF_0006873 - DEF_0006887
A-7	U.S. Patent Pub. No. 2010/0323715 ("Winters")	Dec. 23, 2010 (filed Jun. 18, 2009)	DEF_0006888 - DEF_0006905
A-8	U.S. Patent Pub. No. 2011/0312312 ("Astrom")	Dec. 22, 2011 (filed Jun. 15, 2011)	DEF_0006906 - DEF_0006915
A-9	U.S. Patent Pub. No. 2011/0317631 ("Navda")	Dec. 29, 2011 (filed Jun. 24, 2010)	DEF_0006916 - DEF_0006926
A-10	WO 2013/187892 ("Yilmaz")	Dec. 19, 2013 (PCT filed Jun. 13, 2012)	DEF_0001678 - DEF_0001717

The following non-patent publications are prior art to the '868 Patent under either (1) at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g), and/or pre-AIA 35 U.S.C. § 103; or (2) at least post-AIA 35 U.S.C. §§ 102(a)(1) and/or (a)(2), and/or post-AIA 35 U.S.C. § 103:

<u>Table 2</u>				
<u>Chart</u>	<u>Title</u>	<u>Publication Date</u>	<u>Author(s) / Publisher</u>	<u>Bates No.</u>
A-11	Position Aware Adaptive Communication Systems (“Sand”)	2009	Stephan Sand, Ralph Tanbourgi, Christian Mensing, and Ronald Raulefs / German Aerospace Center	DEF_0001730 - DEF_0001734

The following patents and patent publications are prior art to the ’502 Patent under either

(1) at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g), and/or pre-AIA 35 U.S.C. § 103; or

(2) at least post-AIA 35 U.S.C. §§ 102(a)(1) and/or (a)(2), and/or post-AIA 35 U.S.C. § 103:

<u>Table 3</u>			
<u>Chart</u>	<u>Country/Patent Number</u>	<u>Publication/Issue Date</u>	<u>Bates No.</u>
B-1	U.S. Patent No. 9,544,827 (“Ishii”)	Jan. 10, 2017 (PCT filed Sep. 12, 2012, provisional applications filed Sep. 12, 2011 and Sep. 14, 2011)	DEF_0001945 - DEF_0001999
B-2	U.S. Patent No. 8,509,787 (“Roddy”)	Aug. 13, 2013 (filed Feb. 6, 2012, provisional application filed Jul. 7, 2011)	DEF_0001929 - DEF_0001944
B-3	U.S. Patent No. 9,526,056 (“Tomici”)	Dec. 20, 2016 (provisional applications filed Mar. 22, 2012 and Feb. 14, 2013)	DEF_0004994 - DEF_0005028
B-4	U.S. Patent Publ. No. 2008/0261602 (“Livneh”)	Oct. 23, 2008 (filed Dec. 12, 2007, provisional filed Apr. 18, 2007)	DEF_0001648 - DEF_0001677

<u>Table 3</u>			
<u>Chart</u>	<u>Country/Patent Number</u>	<u>Publication/Issue Date</u>	<u>Bates No.</u>
B-5	U.S. Patent No. 7,321,571 ("Schnack")	Jan. 22, 2008 (filed Sep. 27, 2002)	DEF_0001792 - DEF_0001811
B-6	U.S. Patent Publ. No. 2013/0163508 ("Yu")	Jun. 27, 2013 (PCT filed Sep. 3, 2010)	DEF_0002013 - DEF_0002034
B-7	U.S. Patent Publ. No. 2012/0127941 ("Li")	May 24, 2012 (filed Jan. 27, 2012 as a continuation of PCT application filed Jul. 14, 2010)	DEF_0002000 - DEF_0002012
B-8	U.S. Patent Publ. No. 2007/0030809 ("Dayama")	Feb. 8, 2007 (filed Aug. 8, 2005)	DEF_0001812 - DEF_0001820
B-9	WO 2012/105881 ("Timus")	Aug. 9, 2012 (PCT filed Feb. 4, 2011)	DEF_0001758 - DEF_0001791
B-10	WO 2011/132988 ("Seo")	Oct. 27, 2011 (PCT filed Apr. 22, 2011)	DEF_0001821 - DEF_0001928
B-11	WO 2013/037903 ("Sfar")	Mar. 21, 2013 (PCT filed Sep. 13, 2012)	DEF_0001735 - DEF_0001757

The following non-patent publications are prior art to the '502 Patent under either (1) at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g), and/or pre-AIA 35 U.S.C. § 103; or (2) at least post-AIA 35 U.S.C. §§ 102(a)(1) and/or (a)(2), and/or post-AIA 35 U.S.C. § 103:

<u>Table 4</u>				
<u>Chart</u>	<u>Title</u>	<u>Publication Date</u>	<u>Author(s) / Publisher</u>	<u>Bates No.</u>
B-12	TS 36.814	Mar. 2010	3GPP	DEF_0001313 - DEF_0001415
B-13	The UMTS Long Term Evolution: From Theory to Practice (2nd Ed.	2011	Stefan Sesia, Issam Toufik, Matthew Baker / Wiley	DEF_0000518 - DEF_0001311

<u>Table 4</u>				
<u>Chart</u>	<u>Title</u>	<u>Publication Date</u>	<u>Author(s) / Publisher</u>	<u>Bates No.</u>
	2011) (“LTE Theory to Practice”)			
B-14	4G Evolution: LTE / LTE-Advanced for Mobile Broadband (“4G Evolution”)	2011	Erik Dahlman, Stefan Parkvall, Johan Sköld / Academic Press	DEF_0000087 - DEF_0000517
B-15	A Self-backhauling Solution for LTE-Advanced (“Hoymann”)	Oct. 13, 2008	Christian Hoymann, Andras Racz, Niklas Johansson, Johan Lundsjo / Ericsson Research	DEF_0000039 - DEF_0000043
B-16	LTE-Advanced Relay Technology and Standardization (“LTE-Advanced Relay Technology”)	July 25, 2012	Yifei Yuan	DEF_0002035 - DEF_0002231
B-17	Novatel MiFi 2200 Mobile Wi-Fi Modem for Verizon and Sprint, Novatel MiFi 2372 Mobile Wi-Fi Modem for AT&T (“3G Mobile Hotspots”)	2009 (Novatel MiFi 2200) and 2011 (Novatel MiFi 2372)	Verizon, Sprint, AT&T, Novatel	DEF_0001451 - DEF_0001612

Defendants reserve the right, to the extent permitted by the Court and the applicable statutes and rules, to assert and/or supplement its assertions that the Asserted Claims are invalid under pre-AIA 35 U.S.C. § 102(f) in the event Defendants obtain additional evidence that the named

inventors of the Asserted Patents did not invent (either alone or in conjunction with others) the subject matter claimed in the Asserted Patents. Should Defendants obtain such evidence, it will provide the name of the person(s) from whom, and the circumstances under which, the alleged invention or any part of it was derived.

Defendants further intend to rely on admissions of the named inventors and Headwater concerning the prior art, including statements found in the Asserted Patents, their prosecution histories, and/or other related patents or patent applications, any deposition testimony, and the papers filed and any evidence submitted by Headwater in conjunction with this action.

Finally, Defendants may rely on testimony from the authors or named inventors on any of the prior art references listed above.

Defendants challenge the sufficiency of Headwater's Infringement Contentions. In particular, Headwater's Infringement Contentions fail to disclose its infringement theories with this Court's requisite specificity with respect to the dependent claims of the Asserted Patents; indeed, Headwater's Infringement Contentions fail to provide any information regarding why it believes the accused instrumentalities practice virtually any element of any of the dependent claims of the Asserted Patents.

A. State of the Art at the Time the '868 Patent Was Filed

At the time the '868 Patent was filed, one problem facing wireless communications networks was that link quality between a user equipment and a base station could vary over time as the user equipment moves through space such that user equipment would experience poor quality of service when entering particular locations. '868 Patent at 1:18-24; Vargas-Hurlston at [0002]. As a result, at the time the '868 Patent was filed, techniques to predict the future position of a mobile terminal, estimate parameters of that user equipment—such as link quality—based on

the estimated position and stored information, and allocate resources to the user equipment based on the estimated link quality were all well known in the art.

As an example, at the time the '868 Patent was filed, it was well known to create and maintain a map of radio quality across a coverage area of a network and use this record to predict the radio conditions available to user equipment as they move across the map. *See, e.g.*, Jarvinen at [0005] (“checking a database for transmission conditions of the communication link that are the most optimal”); Fox at 2:47-55 (“The controller may build and maintain a record of radio quality across a coverage area of the network”); Vargas-Hurlston at [0004, 0018] (base station collects transmissions across a geographic area and creates a database storing data that relates communication parameters to a geographic location); Wilhelm at [0020] (“the database is realized as a digital map which assigns link adaptation parameters to geographical regions on the map”); Astrom at [Abstract] (“The method comprises determining location information associated with a location of the device, querying a database using the determined location information, wherein the database stores a plurality of entries each comprising location information and corresponding network quality information”); Navda at [Abstract] (“The method includes receiving a signal quality profile for an area in which the device is located”). It was also known to estimate the position of a user equipment in the future. *See, e.g.*, Jarvinen at [0049] (“A short history of the movement of the mobile terminal may be stored into the memory unit of the mobile terminal to enable prediction of the movement. The prediction of the geographical location the mobile terminal is moving to is carried out in order to change the transmission conditions, if necessary, to more optimal ones before the transmission quality suffers from degradation.”); Fox at 2:65:3-1; Vargas-Hurlston at [0004]; Winter at [Abstract] (“Mobile device locations may be predicted using real-time device location information, destination information, and location history”). One

technique for doing so was to assume that a user equipment traveled in a linear path at a constant speed, and calculate the future location of a user equipment based on its present location and velocity. *See, e.g.*, Fox at 2:65:3-1; *see also* Vargas-Hurlston at [0017] (“mobile wireless telephone network often travel along predictable paths such as highways and populated areas, frequently traversing the same paths on a frequent basis. . . . This leads to an ability to predict with a reasonable degree of accuracy where mobile communication node are moving within a network.”); Wilhelm at [0021] (“a future geographic position of the mobile terminal is predicted based on past movement by extrapolation of the trajectory of the mobile terminal.”); Jarvinen at [0050] (“For example, if the stored movement history indicates that the mobile terminal has traveled through a straight path, the prediction algorithm may predict that the upcoming location of the mobile terminal is the next geographical location located along that straight path and included in the database.”).

Finally, it was known to reference the radio quality map, using the estimated future location of the user equipment, to determine the expected radio conditions of the user equipment at the future position, and, based on the expected radio conditions, modulate the data transmission to the user equipment. *See, e.g.*, Jarvinen at cl. 2 (“The method of claim 1, further comprising . . . checking the database for the transmission conditions of the communication link that are the most optimal according to the determined optimality criterion for a geographical location associated with the predicted movement of the mobile terminal”); Fox at 2:55-65; 3:1-33; Vargas-Hurlston at [0004] (base station transmits communication parameters to user equipment based on the user equipment’s predicted future geographic location). The patents listed in Table 1 also illustrate the state of the art at the time that the ’868 Patent was filed. In addition, the published drafts or releases

of the following technical specifications also demonstrate the state of the art at the time that the '868 Patent was filed:

1. 3GPP 44.060 (v 7.9.0)

In addition, any of the materials cited by the examiner further illustrate the state of the art at the time the '868 Patent was filed.

B. State of the Art at the Time the '502 Patent Was Filed

At the time the '502 Patent was filed, wireless telecommunications systems faced the challenge of creating efficient backhaul systems that could meet the growing demands for more data. *See, e.g.*, Tomici at 1:13-26; Dayama at [0007]. As a result, a number of techniques to provide wireless backhaul for a communications network were known at the time the '502 Patent was filed.

For instance, "LTE Relay" had been proposed as a method for wirelessly routing backhaul traffic between base stations without wired backhaul links and those base stations with wired backhaul links. *See, e.g.*, LTE-Advanced Relay Technology at 2-5 ("In 3GPP, relay study item was officially started in January 2009."); 4G Evolution at 105, 332-34; Yu at [0004] ("Relaying has been proposed as a possibility to enhance the coverage. Apart from this goal of coverage extension, introducing relay concepts may also help in providing a high-bitrate coverage in a high shadowing environment, reducing an average radio-transmission power at User Equipment (UE)."). In the LTE Relay architecture, relay nodes are deployed to offload backhaul traffic between user equipment and "donor" base stations. 4G Evolution at 334; LTE Theory to Practice at 674. User equipment can connect to a relay node using an access link as if they were connecting with a traditional base station, and are not aware that it is connecting to a relay node as opposed to a traditional base station. 4G Evolution at 334. The relay node also connects to the donor base station using an LTE radio interface, and afterwards uses a subset of the terminal side functionality to communicate on the backhaul link. *Id.*

Repeater nodes, which preceded relay nodes and had been available since LTE Release 8 in 2008, were also known. *Id.* Unlike relay nodes, repeater nodes did not process the signal received from the user equipment before forwarding it. LTE Theory to Practice at 674.

At the time the '502 Patent was filed, the use of backhaul-user equipment to offload backhaul traffic was also known:

In the embodiments of the present invention, for ease of description, a device that is set at a radio access point and implements data transmission between the device and a NodeB over a radio transmission link and data transmission between the device and a core network over a cable transmission link is referred to as a self-backhaul UE (Backhaul-User Equipment, B-UE). The B-UE is located within the coverage of the NodeB and has cable resources. Data is forwarded over the cable transmission link between the B-UE and the core network and the radio transmission link between the B-UE and the NodeB. This implements transfer of the backhaul traffic between the NodeB and the core network, thereby implementing radio self-backhaul for the NodeB.

Li at [0029]; *see also* Ishii at 5:3-34 (describing a network device called an “advanced user equipment” that shares a number of structural elements with a conventional UE, thus lowering manufacturing costs, but has a backhaul link to a data network and can be used to offload backhaul traffic to the core network). In fact, even the term “backhaul user equipment” was also known in the prior art. Li at [0029] (describing “Backhaul-User Equipment”). Indeed, the '502 Patent does not describe backhaul user equipment (“bUE”) in detail, but rather assumes that a person of ordinary skill in the art is already aware of bUE. *See generally* '502 Patent.

At the time the '502 Patent was filed, methods were known for selecting a relay node or backhaul user equipment based on one or more parameters for offloading backhaul traffic when a plurality of relay nodes or backhaul user equipment are available. *See, e.g.*, Tomici at 14:44-52, 15:6-27, 15:51-57, 16:28-48, 18:10-26, 19:18-46; Dayama at [0025, 27, 34-35].

Finally, at the time the '502 Patent was filed, it was well known in the context of the aforementioned systems that the transmission power level of the access and/or backhaul traffic could be adjusted, and that communication resources could be allocated to wireless traffic to avoid

interference. *See, e.g.*, 4G Evolution at 183, 185-87, 342-43, 339-41; LTE Theory to Practice at 202-06, 689-90, 692; Ishii at 14:60-15:21, 8:44-67, 14:10-39.

The patents and publications listed in Tables 3 and 4 also illustrate the state of the art at the time that the '502 Patent was filed. In addition, the published drafts or releases of the following technical specifications also demonstrate the state of the art at the time that the '502 Patent was filed:

1. 3GPP TS 36.814 (v. 2.0.0)
2. 3GPP TS 36.216 (v. 10.3.1)
3. 3GPP TS 36.216 (v. 11.0.0)

In addition, any of the materials cited by the examiner further illustrate the state of the art at the time the '502 Patent was filed.

III. P.R. 3-3(b): PRIOR ART THAT ANTICIPATES ONE OR MORE ASSERTED CLAIMS

Subject to Defendants' reservation of rights, Defendants identify the following prior art (as described in the charts attached as Appendices A-1 to A-11 and B-1 to B-17) now known to Defendants that anticipates one or more of the Asserted Claims of the Asserted Patents under pre- and/or post-AIA 35 U.S.C. § 102.

<u>Table 5</u>	
<u>Chart</u>	<u>Prior Art Reference to the '868 Patent</u>
A-1	Corbett
A-2	Komatsu
A-3	Fox
A-4	Vargas-Hurlston
A-5	Wilhelm

<u>Table 5</u>	
<u>Chart</u>	<u>Prior Art Reference to the '868 Patent</u>
A-6	Jarvinen
A-7	Winters
A-8	Astrom
A-9	Navda
A-10	Yilmaz
A-11	Sand

<u>Table 6</u>	
<u>Chart</u>	<u>Prior Art Reference to the '502 Patent</u>
B-1	Ishii
B-2	Roddy
B-3	Tomici
B-4	Livneh
B-5	Schnack
B-6	Yu
B-7	Li
B-8	Dayama
B-9	Timus
B-10	Seo
B-11	Sfar
B-12	TS 36.814
B-13	LTE Theory to Practice
B-14	4G Evolution

<u>Table 6</u>	
<u>Chart</u>	<u>Prior Art Reference to the '502 Patent</u>
B-15	Hoymann
B-16	LTE-Advanced Relay Technology
B-17	3G Mobile Hotspots

Each of the references identified above anticipates one or more of the Asserted Claims of the Asserted Patents by reason of its status as a publication and/or patent disclosing, or a system on sale and/or in public knowledge or use in the United States embodying, the claimed invention before Headwater's asserted priority dates of the Asserted Patents. Thus, each reference identified above constitutes anticipatory prior art under one or more provisions of pre-AIA 35 U.S.C. §§ 102(a), (b), (e), or (g) or post-AIA 35 U.S.C. §§ 102(a)(1) and/or (a)(2).

For each anticipatory prior art reference, Defendants have provided limitation-by-limitation claim charts demonstrating where each limitation of the Asserted Claims of the Asserted Patents is found in the prior art. As noted above, these claim charts are based on Defendants' current understanding of the terms and limitations of Headwater's asserted claims, and Defendants' current understanding of the claim constructions underlying Headwater's infringement contentions. The cited portions of the prior art references are examples and representative of the content of the prior art references, and should be understood in the context of the reference as a whole, as understood by a person of ordinary skill in the art. As noted above, these citations do not necessarily represent every location where a particular claim limitation is found in the prior art, or every instance in which such prior art satisfies the claim limitation. Defendants reserve the right to rely on additional, or different, portions or aspects of the prior art other than those specifically cited in the claim charts provided herewith, including portions of prior

art the disclosure of which is incorporated by reference in the prior art patents and patent application publications identified above.

To the extent a cited prior art reference is deemed not to anticipate a claim as noted in the attached charts for failing to teach or suggest one or more limitations of that claim, Defendants contend that the claim would nonetheless have been obvious to one of ordinary skill in the art at the time of the invention in view of the prior art reference by itself and/or by the combination of the cited prior art reference with one or more other prior art references identified herein and/or common knowledge disclosing the missing claim limitation(s). Defendants set forth specific exemplary combinations of prior art below in Section IV, based on Defendants' current understanding of the Asserted Claims of the Asserted Patents and the apparent claim constructions adopted by Headwater.

IV. P.R. 3-3(b): PRIOR ART THAT RENDERS OBVIOUS ONE OR MORE ASSERTED CLAIMS

Subject to Defendants' reservation of rights, to the extent that the Asserted Claims of the Asserted Patents are deemed not to be anticipated, Defendants contend that the Asserted Claims of the Asserted Patents are invalid as obvious under pre- and/or post-AIA 35 U.S.C. § 103 in view of at least the prior art listed herein and set forth in the attached Appendices. Defendants identify the following combinations of prior art now known to Defendants that render obvious one or more of the Asserted Claims of the Asserted Patents under pre- and/or post-AIA 35 U.S.C. § 103. Defendants also disclose the motivation to combine such items.

Defendants' contentions that the Asserted Claims of the Asserted Patents are obvious under pre- and/or post-AIA 35 U.S.C. § 103 are in no way an admission or suggestion that any prior art relied upon herein is not anticipatory under 35 U.S.C. § 102.

A. Single-Reference Obviousness

Subject to Defendants' reservation of rights, Defendants contend that the prior art references identified below and described in the charts attached as Appendices A-1 to A-11 and B-1 to B-17 by themselves render obvious the Asserted Claims of the Asserted Patents under pre- and/or post-AIA 35 U.S.C. § 103:

<u>Table 7</u>	
<u>Chart</u>	<u>Prior Art Reference to the '868 Patent</u>
A-1	Corbett
A-2	Komatsu
A-3	Fox
A-4	Vargas-Hurlston
A-5	Wilhelm
A-6	Jarvinen
A-7	Winters
A-8	Astrom
A-9	Navda
A-10	Yilmaz
A-11	Sand

<u>Table 8</u>	
<u>Chart</u>	<u>Prior Art Reference to the '502 Patent</u>
B-1	Ishii
B-2	Roddy

<u>Table 8</u>	
<u>Chart</u>	<u>Prior Art Reference to the '502 Patent</u>
B-3	Tomici
B-4	Livneh
B-5	Schnack
B-6	Yu
B-7	Li
B-8	Dayama
B-9	Timus
B-10	Seo
B-11	Sfar
B-12	TS 36.814
B-13	LTE Theory to Practice
B-14	4G Evolution
B-15	Hoymann
B-16	LTE-Advanced Relay Technology
B-17	3G Mobile Hotspots

In addition, common sense applied to a single prior art reference may provide adequate disclosure to meet the Asserted Patents' claim limitations. *Arendi v. Apple*, 832 F.3d 1355, 1363 (Fed. Cir. 2016) (“[W]e conclude that while ‘common sense’ can be invoked, even potentially to supply a limitation missing from the prior art, it must still be supported by evidence and a reasoned explanation. In cases in which ‘common sense’ is used to supply a missing limitation, as distinct from a motivation to combine, moreover, our search for a reasoned basis for resort to common

sense must be searching. And, this is particularly true where the missing limitation goes to the heart of an invention.”). For example, claims 1, 28, 30, 31, 40, and 43 of the ’502 Patent require “selecting a transmission power level of at least one of the bUE devices, and at least one of the one or more UE devices” and “transmit[ting] resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.” Although a particular prior art reference may not disclose in detail transmitting resource block scheduling information or selecting the transmission power level of the backhaul traffic or access traffic, a person of ordinary skill in the art would understand that in order to be compliant with common standards at the time of the invention of the ’502 Patent, they would necessarily be selecting transmission power level and transmitting resource block scheduling information when transmitting backhaul traffic. *See, e.g.*, 4G Evolution at 183, 185-87, 342-43, 339-41; LTE Theory to Practice at 202-06, 689-90, 692. Defendants note that Headwater has alleged infringement of these limitations on the basis that “cellular network connectivity standards describe such functionality.”

As a further example, claim 31 of the ’502 Patent requires that a base station comprise “a controller operative to select one or more of the plurality of bUE devices for backhaul (BH) traffic to the second data network or the BS for BH traffic directly to the first data network.” Although a particular prior art reference may not disclose specifically that a base station’s controller is responsible for selecting from a plurality of bUE devices to transmit backhaul traffic, a person of ordinary skill in the art would have understood that a base station controller could perform this function.⁴

⁴ Defendants note that Headwater has alleged infringement of claim 31 is met on the same bases as Headwater’s infringement allegations regarding independent claim 1, which require that

As a further example, claim 5 of the '502 Patent requires that “one of the plurality bUE devices is at least one of associated with or a part of a small cell BS, wherein the small cell BS comprises client side modem functionality.” Although a particular prior art reference may not disclose specifically that a particular bUE device is part of or associated with a small cell BS with client side modem functionality, a person of ordinary skill in the art would have understood that in order for a small cell BS to function as a bUE device, it would necessarily have client side modem functionality, which the '502 Patent describes as “a subset of UE device or bUE device functionality.” '502 Patent at 6:41-50. Defendants note that Headwater has alleged infringement of dependent claim 5 is met on the same bases as Headwater’s infringement allegations regarding independent claim 1.

As a further example, claim 2 of the '868 Patent requires that “at least one of the future LQ or the plurality of LQs comprises one or more of a path loss (PL), shadowing (S), interference (I), signal to noise ratio (SNR), signal to interference and noise ratio (SINR), signal to interference ratio (SIR), channel quality indicator (CQI), channel state information (CQI), packet error rate (PER).” Although a particular prior art reference may not disclose specifically that a future link quality or plurality of link qualities comprises one of these parameters, a person of ordinary skill in the art would have understood that a link quality could comprise these parameters because these are commonly known parameters that can affect transmission quality. *See, e.g.,* Jarvinen at [0002] (“One reason for radio link adaptation is to overcome attenuation of information signals in a radio channel. The attenuation is typically caused by path loss, shadowing, and fading.”); Winters at [0003] (“Current signal quality parameters may include, for example, current received signal

backhaul traffic is communicated through “a selectable one of [the plurality of bUE devices] to the second data network,” but does not require that the base station’s controller do the selecting.

power, current received signal-to noise ratio, current bit error rate (BER), current block error/erasure rate (BLER), current received quality of speech (RX Qual), current distance between the mobile device and a base station, and other current signal quality parameters.”); Fox at 4:52-54 (“The radio link quality measurements may include CQI, ACK/NACK ratios, BLER, Frame Errors Rates, BERs, Qqual, RSSI, RSCP . . . etc.”).

As a further example, claim 3 of the ’868 Patent requires that “at least one of the future LQ or the information associated with the plurality of LQs is associated with an uplink or downlink transmission.” Although a particular prior art reference may not specifically disclose that a future link quality or plurality of link qualities is associated with an uplink or downlink transmission, a person of ordinary skill in the art would have understood that a link quality could be associated with an uplink or downlink transmission because all transmissions between a user equipment and base station are necessarily uplink or downlink transmissions. *See, e.g.*, ’868 Patent at 3:52-56 (“The wireless communication access traffic may include downlink (originating from the data network 140, 141, 142) or uplink (originating from the UE devices 121, 122, 123) or both downlink (DL) and uplink (UL) traffic.”).

As a further example, claim 4 of the ’868 Patent requires that “at least one of the future LQ or the plurality of LQs is associated with a frequency band or a frequency channel.” Although a particular prior art reference may not disclose specifically that a future link quality or plurality of link qualities is associated with a frequency band or a frequency channel, a person of ordinary skill in the art would have understood that a link quality could be associated with a frequency band or a frequency channel because transmissions between a user equipment and base station occur on a frequency band or frequency channel. *See, e.g.*, Komatsu at 1:15-19 (“It is well known that in a

cellular mobile communication system employing code division multiple access (CDMA), all the users transmit information simultaneously using the same frequency band.”).

As a further example, claim 5 of the ’868 Patent requires that “at least one of the future LQ or the plurality of LQs is associated with a wireless communication technology.” Although a particular prior art reference may not disclose specifically that a future link quality or plurality of link qualities is associated with a wireless communication technology, a person of ordinary skill in the art would have understood that a link quality could be associated with a wireless communication technology because user equipment at the time the ’868 Patent was filed typically communicated with base stations using a wireless communication technology.

B. Obviousness in View of Combinations of References

To the extent a cited prior art reference listed above in Tables 7 and 8 is deemed not to, by itself, render obvious a claim as noted in the attached claim charts for failing to teach or suggest one or more limitations of that claim, then that claim would nonetheless have been obvious to one of ordinary skill in the art at the time of the invention by the combination of the cited prior art reference with one or more of the other prior art references listed in Table 1 and/or Table 2 and/or common knowledge disclosing the missing claim limitations, or Table 3 and/or Table 4 and/or common knowledge disclosing the missing claim limitations. For example, a person of ordinary skill in the art would have been motivated to combine any reference in Table 1 and/or Table 2 with any other reference(s) in Table 1 and/or Table 2 and/or one or more of the references identified as illustrating the state of the art at the time the ’868 Patent was filed. For further example, a person of ordinary skill in the art would have been motivated to combine any reference in Table 3 and/or Table 4 with any other reference(s) in Table 3 and/or Table 4 and/or one or more of the references identified as illustrating the state of the art at the time the ’502 Patent was filed.

Further explanation and examples are provided by the exemplary combinations detailed below. The inclusion of certain example combinations herein does not exclude other combinations based on the claim charts attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early state prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations.

<u>Table 9</u>	
<u>Chart</u>	<u>'868 Claim Limitations Disclosed</u>
A-A	Limitation 1a / 24a: determining a plurality of link qualities (LQs) of a user equipment (UE) for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE; Claim 2: The method of claim 1, wherein at least one of the future LQ or the plurality of LQs comprises one or more of a path loss (PL), shadowing (S), interference (I), signal to noise ratio (SNR), signal to interference and noise ratio (SINR), signal to interference ratio (SIR), channel quality indicator (CQI), channel state information (CQI), packet error rate (PER). Claim 3: The method of claim 1, wherein at least one of the future LQ or the information associated with the plurality of LQs is associated with an uplink or downlink transmission. Claim 4: The method of claim 1, wherein at least one of the future LQ or the plurality of LQs is associated with a frequency band or a frequency channel. Claim 5: The method of claim 1, wherein at least one of the future LQ or the plurality of LQs is associated with a wireless communication technology. Claim 6: The method of claim 1, wherein at least one of the future LQ or the plurality of LQs is associated with a link partner of the UE.

<u>Table 9</u>	
<u>Chart</u>	<u>'868 Claim Limitations Disclosed</u>
	Claim 7: The method of claim 1, wherein a link quality positioning information includes at least one of the determined plurality of LQs, the stored information, the estimated future positioning or the estimated future LQ. Claim 23: The method of claim 1, wherein at least one of the plurality of positionings or the estimated at least one future positioning of the UE further comprises at least one of an error, an accuracy, a deformation, a velocity, an acceleration. Claim 29: The method of claim 24, wherein a link quality neighboring positioning information includes at least one of the determined plurality of LQs, the stored information, the estimated at least a positioning of the UE, the determined at least one neighboring positioning, or the one or more neighboring LQs. Limitation 33c: determine a plurality of link qualities (LQs) of the UE for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE; Limitation 34a: determining a plurality of link qualities (LQs) of one or more user equipment (UE) for a plurality of positionings of the one or more UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of a first UE of the one or more UE;
A-B	Limitation 1b / 24b / 34b: storing information associated with the plurality of LQs for the plurality of positionings; Limitation 33d: store information associated with the plurality of LQs for the plurality of positionings;
A-C	Limitation 1c / 33e: estimating at least one future positioning of the UE; and Limitation 24c: estimating at least a positioning of the UE;

<u>Table 9</u>	
<u>Chart</u>	<u>'868 Claim Limitations Disclosed</u>
	Limitation 24d: determining at least one neighboring positioning of the positioning of the UE; and Limitation 34c: estimating at least one future positioning of a second UE; and
A-D	Limitation 1d: estimating a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE. Claim 20: The method of claim 1, further comprising a second plurality of positionings wherein the second plurality of positionings comprises the at least one future positioning, and further comprising estimating a second plurality of LQs based on the second plurality of positionings. Limitation 24e: estimating one or more neighboring link qualities (LQs) of the UE at the at least one neighboring positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE. Limitation 33f: estimate a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE. Limitation 34d: estimating a future link quality (LQ) of the second UE at the at least one future positioning of the second UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the one or more UE.
A-E	Claim 8: The method of claim 7, wherein the UE obtains at least a portion of the link quality positioning information from a link partner or wherein the UE communicates the at least the portion of the link quality positioning information to the link partner.

<u>Table 9</u>	
<u>Chart</u>	<u>'868 Claim Limitations Disclosed</u>
A-F	Claim 9: The method of claim 7, further comprising determining a UE usage information, wherein at least a portion of the link quality positioning information is based on the UE usage information. Claim 10: The method of claim 9, wherein the UE usage information comprises UE information indicating one or more of a user handheld mode, a hands-free mode, a speaker phone mode, a car Bluetooth mode, a headset Bluetooth mode.
A-G	Claim 11: The method of claim 7, further comprising determining a UE environment information, wherein at least a portion of the link quality positioning information is based on the UE environment information. Claim 12: The method of claim 11, wherein the UE environment information comprises information associated to one or more of a traffic load, a network load, an interference, time of day, whether information, day of year, season. Claim 13: The method of claim 11, wherein the UE environment information comprises information associated with surrounding objects or information associated with a user of the UE. Claim 14: The method of claim 13, wherein the information associated with the user of the UE includes positioning of the user of the UE or positioning of the user of the UE relative to the UE. Claim 15: The method of claim 11, further comprising assisting determining the UE environment information using sensors of the UE. Claim 30: The method of claim 29, further comprising determining a UE environment information, wherein at least a portion of the link quality neighboring positioning information is based on the UE environment information. Claim 31: The method of claim 30, the UE environment information comprises information associated with a user of the UE.

<u>Table 9</u>	
<u>Chart</u>	<u>'868 Claim Limitations Disclosed</u>
A-H	Claim 16: The method of claim 1, further comprising allocating a resource to a UE link, wherein the allocation of the resource to the UE link is based on the estimated future LQ.
A-I	Claim 17: The method of claim 1, further comprising selecting a transmission mode for a UE link, wherein the selecting the transmission mode for the UE link is based on the estimated future LQ. Claim 18: The method of claim 17, wherein the transmission mode comprises one or more of a modulation, a code, a modulation and coding scheme (MCS), a multiple input multiple output (MIMO) mode, a beamforming parameter, a transmit power.
A-J	Claim 19: The method of claim 1, further comprising obtaining at least one future time, and wherein the estimating the at least one future positioning is based on the at least one future time.
A-K	Claim 21: The method of claim 20, further comprising allocating a resource block (RB) to a UE link based on the estimated second plurality of LQs.
A-L	Claim 22: The method of claim 1, wherein the plurality of positionings is constrained to a physical area.
A-M	Claim 25: The method of claim 24, further comprising adjusting or changing a configuration of the UE based on the one or more neighboring LQs.
A-N	Claim 26: The method of claim 24, further comprising presenting the one or more neighboring LQs of the UE at the at least one neighboring positioning.
A-O	Claim 27: The method of claim 24, further comprising selecting a candidate positioning from the at least one neighboring positioning based on the one or more neighboring LQs.

<u>Table 9</u>	
<u>Chart</u>	<u>'868 Claim Limitations Disclosed</u>
	Claim 28: The method of claim 27, further comprising presenting the selected candidate positioning to a user of the UE.
A-P	Claim 32: The method of claim 30, further comprising selecting a joint candidate positioning of the UE and a user of the UE, wherein the joint candidate positioning comprises a combination of a UE positioning and a user positioning relative to the UE.
A-Q	Limitation 33a: a transceiver operative to communicate with a link partner device through a communication link, wherein the communication link includes a link quality;
A-R	Limitation 33b: a controller, the controller operative to:

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
B-A	Limitation 1a / 30a: a base station (BS) operable to communicate directly with a first data network; Limitation 28a: a base station (BS) operative to directly communication with a first data network; Limitation 31a: means for communicating directly with a first data network;
B-B	Limitation 1b / 30b: a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network; Claim 2: The system of claim 1, wherein the plurality of bUE devices wirelessly communicate

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	with the BS over one or more of wireless communication technologies, wherein the one or more wireless communication technologies comprise at least one of WiFi, WiMax, 3G, 4G, LTE, Orthogonal frequency division multiple access (OFDMA), Wideband code division multiple access (WCDMA). Claim 5: The system of claim 1, wherein at least one of the plurality bUE devices is at least one of associated with or a part of a small cell BS, wherein the small cell BS comprises client side modem functionality. Claim 26: The system of claim 1, wherein at least a first bUE device of the plurality of bUE devices transmits or receives access traffic associated with the first bUE. Limitation 28b: a backhaul user equipment (bUE) device, the bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the bUE device operable to communicate with a second data network through at least a second communication technology; Limitation 31b: means for wirelessly communicating with each of a plurality of backhaul user equipment (bUE) devices through at least a first communication technology, wherein the plurality of bUE devices are each operable to communicate with a second data network through at least a second communication technology; Limitation 40a: wirelessly communicate with a base station (BS); Limitation 40b: communicate a second data network through at least a second communication technology; wherein Limitation 40c: the bUE device is one of a plurality of bUE devices, wherein each of the bUE devices is also operable to communicate with second data network;

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	Limitation 43a: wirelessly communicating, by at least one of a plurality of backhaul user equipment (bUE) devices, with a base station (BS) through at least a first communication technology; Limitation 43b: communicating, by at least one of the plurality of bUE devices, with a second data network through at least a second communication technology;
B-C	Limitation 1c: the BS operative to: wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through a third communication technology; Claim 3: The system of claim 1, wherein the one or more UE devices wirelessly communicate with the BS and the plurality of bUE devices wirelessly communicate with the BS utilizing a same wireless communication technology. Claim 4: The system of claim 3, wherein the one or more UE devices wirelessly communicate with the BS, and the plurality of bUE devices wirelessly communicate with the BS utilizing the same wireless communication technology and a shared one or more frequency channels. Claim 16: The system of claim 1, wherein the wireless communication between the plurality of bUE devices and the BS is enhanced relative to the wireless communication between the BS and at least one of the one or more UE devices, wherein the enhanced wireless communication comprises one or more of better antenna gain, more antennas, outdoor installation, better processing power, better transmit or receive analog or digital performance, lower transmit power, higher or outdoor installation, improved link parameters, improved number of antennas.

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	Limitation 28c: the BS operative to: communicate with the first data network over at least a third communication technology; Limitation 28d: [the BS operative to:] wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through the third communication technology; Claim 29: The system of claim 28, wherein the BS is further operative to obtain one or more third parameters associated with the first data network through at least the third communication technology. Limitation 30c: the BS operative to: communicate with the first data network through at least a third communication technology; Limitation 30d: [the BS operative to:] wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the first data network or the second data network through one or more of the plurality of bUE devices or the third communication technology; Limitation 31c: means for wirelessly communicating with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices or to the first data network through a third communication technology; Claim 32: The BS of claim 31, wherein the one or more UE devices wirelessly communicate with the BS and the plurality of bUE devices wirelessly communicate with the BS utilizing a same wireless communication technology. Limitation 40g: the BS wirelessly communicates with the one or more user equipment (UE) devices, and network connects the one or more UE devices to the second data network through one or more of the plurality of bUE devices or to a first data network

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	through a third communication technology, wherein the first data network is different than the second data network. Limitation 43c: wirelessly communicating, by the BS, with one or more user equipment (UE) devices, and network connecting the one or more UE devices to the a second data network through one or more of the plurality of bUE devices or to a first data network through a third communication technology, wherein the second data network is different than the first data network;
B-D	Limitation 1d: [the BS operative to:] communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic from the one or more UE devices; Limitation 28e: [the BS operative to:] communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic associated with the one or more UE devices; Limitation 30e: [the BS operative to:] communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first network through the third communication technology wherein the BH traffic comprises access traffic associated with the one or more UE devices; Limitation 31d: a controller operative to select one or more of the plurality of bUE devices for backhaul (BH) traffic to the second data network or the BS for BH traffic directly to the first data network, wherein the BH traffic comprises access traffic associated with the one or more UE devices; Limitation 40d: the bUE further operative to: be selected from the plurality of bUE devices for

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	backhaul (BH) traffic to the second data network, wherein the BH traffic comprises access traffic associated with one or more UE devices; Limitation 40e: [the bUE further operative to:] receive from the BS a signal for aiding in selecting a transmission power level; Limitation 43d: selecting, one or more of the plurality of bUE devices for backhaul (BH) traffic to the second data network or the BS for BH traffic to the first data network, wherein the BH traffic comprises access traffic associated with the one or more UE devices;
B-E	Limitation 1e / 30f: [the BS operative to:] aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and; Claim 13: The system of claim 1, wherein the BS operative to aid in selecting the transmission power level of at least one of the plurality of bUE devices, or the one or more UE devices is assisted by a signal transmitted by the BS. Limitation 28f: [the BS operative to:] aid in selecting a transmission power level of at least one of the bUE devices, and at least one of the one or more UE devices; and Limitation 31e: the controller operative to aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and Limitation 43e: aiding, by the BS, in selecting a transmission power level of at least one of the plurality of bUE devices, or at least one of the one or more UE devices; and
B-F	Limitation 1f / 28g / 30g: [the BS operative to:] transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	Claim 14: The system of claim 1, wherein a resource block comprises a partition of a carrier or frequency channel for the wirelessly communicating. Claim 15: The system of claim 14, wherein the partition comprises one or more of a unit of time, a unit of frequency, a code. Limitation 31f: means for transmitting resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices. Limitation 40f: [the bUE further operative to:] receive from the BS transmit resource block (RB) scheduling information for the BH traffic; wherein Limitation 43f: transmitting, by the BS, resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.
B-G	Claim 6: The system of claim 1, wherein the BS is further operative to obtain one or more first parameters associated with the wireless communication between one or more of the plurality of bUE devices and the BS. Claim 7: The system of claim 6, wherein a selection of the one or more of the plurality of bUE devices for the BH traffic is based on the first parameters. Claim 8: The system of claim 6, wherein the one or more first parameters comprises one or more of a link quality, link quality statistics, link quality variation, path loss, fading, shadowing, Signal to Noise Ratio (SNR), Signal to Interference and Noise Ratio (SINR), Packet Error Rate (PER), received interference, interference generated to other devices, Channel Quality Indicator (CQI), Channel State Information (CSI), Modulation and Coding Scheme (MCS), Precoding Matrix Indicator (PMI), rank indicator (RI), single user or multiuser Multiple

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	Input Multiple Output (SU-MIMO or MU-MIMO) information. Claim 19: The system of claim 1, wherein a bUE device selection of one or more of the plurality of bUE devices is based on one or more first parameters of the wireless communication between the bUE device and the BS or one or more second parameters of associated with the second data network through at least the second communication technology. Claim 20: The system of claim 19, wherein the first parameter of the bUE device selection is based on a joint first parameter between at least two of the plurality of bUE devices. Claim 21: The system of claim 20, wherein the joint first parameter enables joint or simultaneous wireless communication on a shared resource block (RB) of at least two of the plurality of bUE devices. Claim 33: The BS of claim 31, wherein the controller of the BS is further operative to obtain one or more first parameters associated with the wireless communication between one or more of the plurality of bUE devices and the BS. Claim 34: The BS of claim 33, wherein the selection of the one or more of the plurality of bUE devices for the BH traffic is based on the first parameters. Claim 44: The method of claim 43, further comprising obtaining one or more first parameters associated with the wireless communication between one or more of the plurality of bUE devices and the BS. Claim 45: The method of claim 44, wherein the selection of the one or more of the plurality of bUE devices for the BH traffic is based on the first parameters.
B-H	Claim 9: The system of claim 1, wherein the BS is further operative to obtain one or more second parameters associated with the second data network through at least the second communication technology.

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	Claim 10: The system of claim 9, wherein a selection of the one or more of the plurality of bUE devices for the BH traffic is based on the one or more second parameters. Claim 11: The system of claim 9, wherein the one or more second parameters comprise one or more of a link quality, bandwidth, throughput, cost, latency, jitter, QoS, PER. Claim 35: The BS of claim 31, wherein the controller of the BS is further operative to obtain one or more second parameters associated with the second data network through at least the second communication technology. Claim 36: The BS of claim 35, wherein the selection of the one or more of the plurality of bUE devices for the BH traffic is based on the one or more second parameters. Claim 39: The BS of claim 31, wherein a bUE selection of one or more of the plurality of bUE devices is based on one or more first parameters of the wireless communication with the BS or one or more second parameters of the second communication technology. Claim 46: The method of claim 43, wherein a bUE selection of one or more of the plurality of bUE devices is based on one or more first parameters of the wireless communication with the BS or one or more second parameters of the second communication technology.
B-I	Claim 12: The system of claim 1, wherein the access traffic associated with the one or more UE devices is classified into two or more data flows based on a data flow parameter and the selection of the one or more plurality of bUE devices for the BH traffic is based in part on the data flow parameter. Claim 37: The BS of claim 31, wherein the access traffic associated with the one or more UE devices is classified into two or more data flows based on a data flow parameter and the selection of the one or

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
	more plurality of bUE devices for the BH traffic is based in part on the data flow parameter.
B-J	Claim 17: The system of claim 1, further comprising classifying and prioritizing the BH traffic based on the access traffic, and wherein the RB scheduling information for the BH traffic is based on the BH traffic prioritization. Claim 18: The system of claim 17, further comprising classifying and prioritizing the access traffic, wherein the RB scheduling information for the access traffic and the BH traffic is based on the access traffic prioritization and BH traffic prioritization. Claim 38: The BS of claim 31, wherein the controller of the BS is further operative to classify and prioritize the BH traffic based on the access traffic, and wherein the RB scheduling information for the BH traffic is based on the BH traffic prioritization.
B-K	Claim 22: The system of claim 1, further comprising selecting the plurality of bUE devices such that at least one of the one or more UE devices has an associated bUE, thereby enabling joint or simultaneous wireless communication. Claim 23: The system of claim 22, wherein the joint wireless communication over the one or more shared RB comprises joint wireless communication utilizing one or more of communication separable in space, multilevel constellation, transmitter pre-coding or receiver separation.
B-L	Claim 24: The system of claim 1, wherein the BS is one of a plurality of BSs, wherein the plurality of BSs are each assigned one or more frequency channels based on a soft frequency reuse (SFR) scheme with at least a low transmit power level and a high transmit power level, and wherein the plurality of bUE devices are assigned a resource block (RB) at the low transmit power level.

<u>Table 10</u>	
<u>Chart</u>	<u>'502 Claim Limitations Disclosed</u>
B-M	Claim 25: The system of claim 1, wherein the BS is one of a plurality of BSs, wherein the plurality of BSs are each assigned one or more frequency channels based on a fractional frequency reuse (FFR) scheme and wherein the plurality of bUE devices are assigned a resource block (RB) having a higher frequency reuse than a resource block (RB) assigned to the one or more UE devices.
B-N	Claim 27: The system of claim 1, wherein a first bUE device is dynamically added to or deleted from the plurality of bUE devices based on one or more first parameters associated with the wireless communication between the first bUE device and the BS or one or more second parameters associated with second data network through at least the second communication technology associated with the first bUE device.
B-O	Claim 41: The bUE device of claim 40, further operative to process a BH traffic header information based on the second data network through the at least a second communication technology.
B-P	Claim 42: The bUE device of claim 40, further operative to send or receive a traffic intended for the bUE, wherein the bUE selects between wirelessly communicating the traffic with the BS or communicating the traffic with the second data network through the at least second communication technology.

The following includes examples of references that a person of ordinary skill in the art would have been motivated to combine:

1. Exemplary Combinations Involving Jarvinen (Appendix A-6)

Exemplary combinations involving Jarvinen (Appendix A-6) include the following:

- Jarvinen (Appendix A-6) + Corbett (Appendix A-1)
- Jarvinen (Appendix A-6) + Komatsu (Appendix A-2)

- Jarvinen (Appendix A-6) + Fox (Appendix A-3)
- Jarvinen (Appendix A-6) + Vargas-Hurlston (Appendix A-4)
- Jarvinen (Appendix A-6) + Wilhelm (Appendix A-5)
- Jarvinen (Appendix A-6) + Winters (Appendix A-7)
- Jarvinen (Appendix A-6) + Astrom (Appendix A-8)
- Jarvinen (Appendix A-6) + Navda (Appendix A-9)
- Jarvinen (Appendix A-6) + Yilmaz (Appendix A-10)
- Jarvinen (Appendix A-6) + Sand (Appendix A-11)

2. Exemplary Combinations Involving Wilhelm (Appendix A-5)

Exemplary combinations involving Wilhelm (Appendix A-5) include the following:

- Wilhelm (Appendix A-5) + Corbett (Appendix A-1)
- Wilhelm (Appendix A-5) + Komatsu (Appendix A-2)
- Wilhelm (Appendix A-5) + Fox (Appendix A-3)
- Wilhelm (Appendix A-5) + Vargas-Hurlston (Appendix A-4)
- Wilhelm (Appendix A-5) + Jarvinen (Appendix A-6)
- Wilhelm (Appendix A-5) + Winters (Appendix A-7)
- Wilhelm (Appendix A-5) + Astrom (Appendix A-8)
- Wilhelm (Appendix A-5) + Navda (Appendix A-9)
- Wilhelm (Appendix A-5) + Yilmaz (Appendix A-10)
- Wilhelm (Appendix A-5) + Sand (Appendix A-11)

3. Exemplary Combinations Involving Vargas-Hurlston (Appendix A-4)

Exemplary combinations involving Vargas-Hurlston (Appendix A-4) include the following:

- Vargas-Hurlston (Appendix A-4) + Corbett (Appendix A-1)
- Vargas-Hurlston (Appendix A-4) + Komatsu (Appendix A-2)
- Vargas-Hurlston (Appendix A-4) + Fox (Appendix A-3)
- Vargas-Hurlston (Appendix A-4) + Wilhelm (Appendix A-5)
- Vargas-Hurlston (Appendix A-4) + Jarvinen (Appendix A-6)
- Vargas-Hurlston (Appendix A-4) + Winters (Appendix A-7)
- Vargas-Hurlston (Appendix A-4) + Astrom (Appendix A-8)
- Vargas-Hurlston (Appendix A-4) + Navda (Appendix A-9)
- Vargas-Hurlston (Appendix A-4) + Yilmaz (Appendix A-10)
- Vargas-Hurlston (Appendix A-4) + Sand (Appendix A-11)

4. Exemplary Combinations Involving Tomici (Appendix B-3)

Exemplary combinations involving Tomici (Appendix B-3) include the following:

- Tomici (Appendix B-3) + Ishii (Appendix B-1)
- Tomici (Appendix B-3) + Roddy (Appendix B-2)
- Tomici (Appendix B-3) + Livneh (Appendix B-4)
- Tomici (Appendix B-3) + Schnack (Appendix B-5)
- Tomici (Appendix B-3) + Yu (Appendix B-6)
- Tomici (Appendix B-3) + Li (Appendix B-7)
- Tomici (Appendix B-3) + Dayama (Appendix B-8)
- Tomici (Appendix B-3) + Timus (Appendix B-9)
- Tomici (Appendix B-3) + Seo (Appendix B-10)
- Tomici (Appendix B-3) + Sfar (Appendix B-11)
- Tomici (Appendix B-3) + TS 36.814 (Appendix B-12)
- Tomici (Appendix B-3) + LTE Theory to Practice (Appendix B-13)
- Tomici (Appendix B-3) + 4G Evolution (Appendix B-14)
- Tomici (Appendix B-3) + Hoymann (Appendix B-15)
- Tomici (Appendix B-3) + LTE-Advanced Relay Technology (Appendix B-16)
- Tomici (Appendix B-3) + 3G Mobile Hotspots (Appendix B-17)

5. Exemplary Combinations Involving Ishii (Appendix B-1)

Exemplary combinations involving Ishii (Appendix B-1) include the following:

- Ishii (Appendix B-1) + Roddy (Appendix B-2)
- Ishii (Appendix B-1) + Tomici (Appendix B-3)
- Ishii (Appendix B-1) + Livneh (Appendix B-4)
- Ishii (Appendix B-1) + Schnack (Appendix B-5)
- Ishii (Appendix B-1) + Yu (Appendix B-6)
- Ishii (Appendix B-1) + Li (Appendix B-7)
- Ishii (Appendix B-1) + Dayama (Appendix B-8)
- Ishii (Appendix B-1) + Timus (Appendix B-9)
- Ishii (Appendix B-1) + Seo (Appendix B-10)
- Ishii (Appendix B-1) + Sfar (Appendix B-11)
- Ishii (Appendix B-1) + TS 36.814 (Appendix B-12)
- Ishii (Appendix B-1) + LTE Theory to Practice (Appendix B-13)
- Ishii (Appendix B-1) + 4G Evolution (Appendix B-14)
- Ishii (Appendix B-1) + Hoymann (Appendix B-15)
- Ishii (Appendix B-1) + LTE-Advanced Relay Technology (Appendix B-16)
- Ishii (Appendix B-1) + 3G Mobile Hotspots (Appendix B-17)

6. Exemplary Combinations Involving LTE-Advanced Relay Technology (Appendix B-16)

Exemplary combinations involving (LTE-Advanced Relay Technology (Appendix B-16) include the following:

- LTE-Advanced Relay Technology (Appendix B-16) + Ishii (Appendix B-1)
- LTE-Advanced Relay Technology (Appendix B-16) + Roddy (Appendix B-2)
- LTE-Advanced Relay Technology (Appendix B-16) + Tomici (Appendix B-3)
- LTE-Advanced Relay Technology (Appendix B-16) + Livneh (Appendix B-4)
- LTE-Advanced Relay Technology (Appendix B-16) + Schnack (Appendix B-5)
- LTE-Advanced Relay Technology (Appendix B-16) + Yu (Appendix B-6)
- LTE-Advanced Relay Technology (Appendix B-16) + Li (Appendix B-7)
- LTE-Advanced Relay Technology (Appendix B-16) + Dayama (Appendix B-8)
- LTE-Advanced Relay Technology (Appendix B-16) + Timus (Appendix B-9)
- LTE-Advanced Relay Technology (Appendix B-16) + Seo (Appendix B-10)
- LTE-Advanced Relay Technology (Appendix B-16) + Sfar (Appendix B-11)
- LTE-Advanced Relay Technology (Appendix B-16) + TS 36.814 (Appendix B-12)
- LTE-Advanced Relay Technology (Appendix B-16) + LTE Theory to Practice (Appendix B-13)
- LTE-Advanced Relay Technology (Appendix B-16) + 4G Evolution (Appendix B-14)
- LTE-Advanced Relay Technology (Appendix B-16) + Hoymann (Appendix B-15)
- LTE-Advanced Relay Technology (Appendix B-16) + 3G Mobile Hotspots (Appendix B-17)

These combinations are merely examples. Defendants contend that any of the references identified in Table 1 and/or Table 2, and/or the references identified as illustrating the state of the art at the time the '868 Patent was filed could be combined to disclose all limitations of the Asserted Claims of the '868 Patent. Defendants also contend that any of the references identified in Table 3 and/or Table 4, and/or the references identified as illustrating the state of the art at the time the '502 Patent was filed could be combined to disclose all limitations of the Asserted Claims of the '502 Patent. Such combinations would be achieved, for example, by merely combining the disclosures documented in the respective claim charts for each reference.

To that end, Appendices A-A to A-R and B-A to B-P provide, on a limitation-by-limitation basis, an indication of specific references that disclose each limitation of each Asserted Claim of the Asserted Patents. The specific disclosures of the various references cited in Appendices A-A to A-R can be found in the charts included in Appendices A-1 to A-11. The specific disclosures of

the various references cited in Appendices B-A to B-P can be found in the charts included in Appendices B-1 to B-17. Additionally, as explained further below, to the extent any particular reference charted in the Appendices is found not to disclose a limitation explicitly or inherently, and that limitation would not have been obvious to a person of ordinary skill in the art based on the disclosure of the particular reference, the reference readily could be combined with any or all of the references listed as disclosing that limitation in Appendices A-A to A-R and B-A to B-P.

C. Motivations to Combine

One or more combinations of the prior art references identified above would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art that would have led one skilled in the art to modify the prior art or to combine the prior-art teachings to arrive at the claimed invention. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable variations based on predictable design incentives and/or market forces either in the same field or a different one.

Stated differently, the motivation to combine the teachings of the prior art references disclosed herein is found in the references themselves and: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified

predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

As the United States Supreme Court held in *KSR Int'l. Co. v. Teleflex Inc.*, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” 550 U.S. 398, 416 (2007). The Supreme Court further held that, “[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . . .” *Id.* at 417. “In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim.” *Id.* at 1741-1742. “Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *Id.* at 1742. In particular, the Supreme Court emphasized the principle that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 1739. A key inquiry is whether the “improvement is more than the predictable use of prior art elements according to their established functions.” *Id.* at 1740.

The rationale to combine or modify prior art references is significantly stronger when the references seek to solve the same problem, come from the same field, and correspond well to each

other. *In re Inland Steel Co.*, 265 F.3d 1354, 1362 (Fed. Cir. 2001). The Federal Circuit has held that two references may be combined as invalidating art under similar circumstances, namely “[the prior art] focus[es] on the same problem that the . . . patent addresses. Moreover, both [prior art references] come from the same field Finally, the solutions to the identified problems found in the two references correspond well.” *Id.* at 1364.

Accordingly, a person of skill in the art would have been motivated to combine or adapt known or familiar methods in the art, especially where market forces prompt such variations. For example, at the time the ’502 Patent was filed, market forces demanded wireless communication systems that could efficiently satisfy the growing demand for backhaul capacity and provide coverage to ever-expanding areas where traditional backhaul options were too costly or simply not feasible. *See, e.g.*, Tomici at 1:13-26 (mobile traffic to increase from 90,000 terabytes in 2009 to an expected 3.6 million terabytes in 2014); Dayama at [0007] (a major challenge of the time was building a wireless communication system that could satisfy the growing demand); Ishii at 2:36-38 (problem to be solved was increasing network capacity); Schnack at 2:1-8 (problem at the time was installing backhaul links in areas where terrain was too rugged for traditional wired backhaul); Li at [0003, 0006] (“With the large-scale application of a radio communication network, how to rapidly deploy the network and how to reduce the network costs become critical issues for mobile operators. . . . The conventional cable backhaul presents issues such as high engineering costs, long construction period, high operating expenditure, and complex site selection and deployment, which hinder further development.”); Timus at 2:20-32 (there was continuous development of new mobile communication technologies to cope with demands of higher data rates, improved efficiency, and lower costs). Certain persons of ordinary skill in the art contended that wireless backhaul was necessary to expand coverage of communications networks. Therefore, those

persons of ordinary skill in the art would have found it obvious to combine and/or modify the references in Tables 3 and/or 4 based on the purported efficiencies of existing approaches to increasing the coverage and efficiency of backhaul networks. Each of the above references describes methods that were known to offer such improvements, and, accordingly, one of skill in the art would have been motivated to combine or modify the references as identified in each of the above combinations. Indeed, many of the prior art references identified here and in the accompanying charts are taken from the same or similar fields to that of the '502 Patent (i.e., wireless telecommunications, and specifically systems and methods of providing a backhaul connection). It would have been obvious to try combining these prior art references because there were only a finite number of predictable solutions, each with a reasonable expectation of success.

As another example, at the time the '868 Patent was filed, market forces demanded methods of estimating the link quality between a user equipment and a base station as the user equipment moves through space because continuously exchanging link quality information between a user equipment and base station would be too costly in terms of wireless communication resources. *See* '868 Patent at 18-36. A person of ordinary skill in the art would have found it obvious to combine and/or modify the references in Tables 1 and/or 2 based on the known efficiencies of existing approaches to maintaining a map of estimated link qualities within a coverage area, determining the future location of a user equipment as in a coverage area, and then estimating the link quality of the user equipment as it moves through the coverage area. It would have been obvious to try combining these prior art references because there were only a finite number of predictable solutions, each with a reasonable expectation of success.

Moreover, the Supreme Court has held that “familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings

of multiple patents together like pieces of a puzzle.” *Id.* at 420. Indeed, the Supreme Court held that it is sufficient that a combination of elements was “obvious to try,” holding that, “[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.” *Id.* at 421.

In the case of the ’502 Patent, the state of the art in providing a backhaul connection for a communications network had set forth a small number of known alternatives to the traditional wired backhaul between a base station and a core network (*see, e.g.*, LTE Theory to Practice at 674, 676, 676, 684, 687-688; 4G Evolution at 334; Yu at [0004]; Li at [0029]; Ishii at 5:3-34), as well as a finite number of techniques for allocating resources for backhaul traffic and/or minimizing interference between the backhaul traffic and other traffic (*see generally, e.g.*, 4G Evolution at 183, 185-87, 342-43, 339-41; LTE Theory to Practice at 202-06, 689-90, 692; Ishii at 14:60-15:21, 8:44-67, 14:10-39), and one of skill in the art would have thought to implement multiple of these techniques concurrently in order to further increase the purported efficiencies gained by employing each technique separately. Stated differently, the references above demonstrate that there were, at the time of the alleged invention, a finite number of identified, predictable solutions for providing wireless backhaul communications, and that persons of ordinary skill in the art would have known how to successfully combine, making the claimed invention obvious. Accordingly, one of skill in the art would have been motivated to combine the references as identified in each of the combinations above.

In the case of the ’868 Patent, the state of the art in estimating link quality had set forth a small number of methods to determine and maintain a map of link qualities within a coverage area,

a small number of methods to estimate the future location of a user equipment as in a coverage area, and a small number of ways to estimate the link quality of the user equipment as it moves through the coverage area and use that information to modulate the communication between the user equipment and a base station. Stated differently, the references above demonstrate that there were, at the time of the alleged invention, a finite number of identified, predictable solutions for providing backhaul communications, and that persons of ordinary skill in the art would have known how to successfully combine, making the claimed invention obvious. Accordingly, one of skill in the art would have been motivated to combine the references as identified in each of the combinations above.

Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the asserted claims; the existence of a known need or problem in the field of endeavor at the time of the invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art. Indeed, the prior art references in Tables 3 and 4 seek to solve the very same problem as the '502 Patent: enhancing backhaul communication in wireless networks. *See, e.g., '502 Patent at 1:31-33; Timus at [Abstract]*. Likewise, the prior art references in Tables 1 and 2 seek to solve the same problem as the '868 Patent: estimating the link quality of a user equipment as it moves through space. *See, e.g., '868 Patent at 18-36; Vargas-Hurlston at [0002-0004]*.

Moreover, the art identified above relates to the same or similar areas of technology: wireless communications, and specifically methods of enhancing the backhaul connection of a wireless communications network. *See, e.g., In re Katz Interactive Call Processing Pat. Litig., No.*

07-ML-01816-C RGK, 2010 WL 8759131, at *22 (C.D. Cal. Jan. 29, 2010) (“This Court agrees with the defendants’ reasoning and also notes that the two prior art references are not just in related fields. They are in the same field. . . . Accordingly, the Court finds that there is a motivation to combine McFiggins and the Pitney Bowes 6500”); *Ex Parte Mettke*, No. 2008-0610, 2008 WL 4448201, at *17 (B.P.A.I. Sept. 30, 2008), *aff’d*, 570 F.3d 1356 (Fed. Cir. 2009) (finding motivation to combine four prior art references to invalidate the claim because they are “from the same corporation, [], and expressly teach modification, variations, and improvement to a pay-for-use public communications terminal.”). For example, the prior art references in Tables 3 and 4 teach systems, methods, and apparatuses for providing alternatives to a traditional wired backhaul connection between a base station and a core network. A person of ordinary skill in the art would have been motivated to combine the references disclosed herein to arrive at the claimed invention of the ’502 Patent because of the need and desire to more efficiently expand the coverage of telecommunications networks with ever-increasing backhaul needs. As another example, the prior art references in Tables 1 and 2 teach systems, methods, and apparatuses for maintaining a map of link qualities within a coverage area, estimating the location of a user equipment as in a coverage area, and thereby estimating the link quality of the user equipment as it moves through the coverage area. A person of ordinary skill in the art would have been motivated to combine the references disclosed herein to arrive at the claimed invention of the ’868 Patent because of the need and desire to more efficiently update the link quality of a user equipment as it moves through space without having to resort to continuously monitoring the link quality.

Based on the above, a person of ordinary skill in the art would, for example have motivated to combine Tomici with Dayama, Timus, and/or Ishii. These references are in the same field of wireless telecommunications and all seek to solve the same problem: creating backhaul solutions

that could satisfy the ever-increasing demand for data. *See, e.g.*, Tomici at 1:13-26 (mobile traffic to increase from 90,000 terabytes in 2009 to an expected 3.6 million terabytes in 2014); Dayama at [0007] (a major challenge of the time was building a wireless communication system that could satisfy the growing demand); Ishii at 2:36-38 (problem to be solved was increasing network capacity); Timus at 2:20-32 (there was continuous development of new mobile communication technologies to cope with demands of higher data rates, improved efficiency, and lower costs).

Also based on the above, and as another example, a person of ordinary skill in the art would have been motivated to combine Dayama with Sfar, Tomici and/or Roddy. Dayama discloses a method of selecting an alternate backhaul that has a higher throughput than the current backhaul. Dayama at [0025]. However, Dayama also discloses that “[i]t will be appreciated, however, that the technique [discussed above] is merely one example of a technique that the base stations 22a-22d may use to select a backhaul. In alternate embodiments, the base stations 22a-22d may employ a wide variety of suitable selection techniques.” Dayama at [0027]. Sfar, Tomici, and Roddy disclose other techniques for selecting a backhaul. *See, e.g.*, Sfar at 3:12-34; Roddy at 8:14-30; Tomici at 19:18-46. Thus a person of ordinary skill in the art would have been motivated to use the backhaul selection techniques disclosed in Sfar, Tomici, and Roddy with Dayama.

Also based on the above, and as another example, a person of ordinary skill in the art would have motivated to combine any number of Li, Seo, Hoymann, LTE Theory to Practice, and LTE-Advanced Relay Technology because they all disclose the same technology, LTE Relay, and are trying to solve the same problem of finding a new method of wirelessly transmitting backhaul traffic. *See generally* Li, Seo, Hoymann, LTE Theory to Practice, and LTE-Advanced Relay Technology. For instance, Seo discloses a method for allocating power and configuring physical resources between an eNodeB and relay node. Seo at 2:7-29. Thus a person of ordinary skill in the

art looking to practice the inventions disclosed in Li, Hoymann, LTE Theory to Practice, and LTE-Advanced Relay Technology, which relate to communicating backhaul via a relay node, would look to the improvements disclosed in Seo. Likewise, a person of ordinary skill in the art would be motivated to combine Sfar, Tomici, and Livneh because they all disclose the same technology: offloading backhaul traffic via a network of femtocells. Tomici at 1:30-61; Livneh at [Abstract].

Also based on the above, and as another example, a person of ordinary skill in the art would have been motivated to combine Jarvinen with Winters. Jarvinen discloses monitoring the movement of a user equipment having a communication link with a base station, checking a database for the optimal transmission conditions for the location of the user equipment, and using those transmission conditions in that location to provide a more optimal communication link. Jarvinen at [0005]. Winters discloses predicting future mobile device locations and optimizing a mobile communication link between a user equipment and base station based on the predicted location. Winters at [0013]. This is because Jarvinen and Winters seek to achieve the same goal in the same field: optimizing the communication link between a user equipment and base station as a user equipment changes locations. *See, e.g.*, Jarvinen at [0005]; Winters at [0013]. This is also because Jarvinen and Winters try to solve the problem in the same way: first determining information communication parameters for a plurality of locations, determining which of the plurality of locations a user equipment is currently in, and using the communication parameters for that location. *See id.*

Also based on the above, and as another example, a person of ordinary skill in the art would have been motivated to combine Hoymann and Schnack. This is because Hoymann and Schnack originated in the same company (Ericsson) and were in the same field (offloading backhaul traffic). *See In re Katz*, 2010 WL 8759131, at *22; *Ex Parte Mettke*, 2008 WL 4448201, at *17. Likewise,

a person of ordinary skill in the art would have been motivated to combine Jarvinen and Yilmaz. This is because Jarvinen and Yilmaz originated in the same company (Nokia) and were in the same field, wireless communications. *See id.*

Much of the art identified above and in the attached Appendices reflects common knowledge and the state of the art prior to the respective filing dates of the Asserted Patents and/or at the time each alleged invention was made. In many instances where a particular contention calls for, or requires, combining references, any one of a number of references can be combined. The inclusion of certain example combinations herein do not exclude other combinations based on the claim charts attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations.

Defendants also contend that any reference or combination of references that anticipates or makes obvious an asserted independent claim of the Asserted Patents at least also makes obvious any asserted claim dependent on that independent claim, because the additional elements of each asserted dependent claim of the Asserted Patents were not innovative and in fact were well-known to persons having ordinary skill at the time of the alleged invention. Thus, it would have been obvious to combine the additional elements recited in the dependent claims of the Asserted Patents with the elements recited in the independent claims at least as a matter of common sense and routine innovation. Accordingly, Defendants contend that each asserted dependent claim of the Asserted Patents would have been obvious not only by the combinations explicitly defined in these contentions, but also by any combination of references that renders obvious the claim(s) from which it depends.

V. P.R. 3-3(c): CLAIM CHARTS

Pursuant to Local P.R. 3-3(c), and subject to Defendants' reservation of rights contained herein, the invalidity claim charts, attached hereto as Appendices A-1 to A-11 and B-1 to B-17 identify where in each item of prior art each element of each asserted claim is found for the asserted claims of the Asserted Patents, including for each element that is governed by pre-AIA 35 U.S.C. § 112, ¶ 6 and/or post-AIA 35 U.S.C. § 112(f), the identity of the structure(s), act(s), or material(s) in each item of prior art that performs the claimed function. The structure(s), act(s), or material(s) identified by Defendants, and the associated structure(s), act(s), or material(s) recited in each item of prior art, perform(s) each element's claimed function. Certain elements of the Asserted Patents that are governed by 35 U.S.C. § 112, ¶ 6 and/or post-AIA 35 U.S.C. § 112(f) are identified below in Section VI.

As noted above, the cited portions of the prior art references are examples and representative of the content of the prior art references, and should be understood in the context of the reference as a whole, as understood by one of ordinary skill in the art. To the extent any cited prior art reference is deemed not to anticipate a claim as noted in the attached charts for failing to teach or suggest one or more limitations of that claim, the limitation would nonetheless have been inherent in the reference and/or obvious to one of ordinary skill in the art at the time of the alleged invention(s), either alone or by the combination of the cited prior art references with any of the other listed references and/or common knowledge disclosing the missing claim limitations. Non-limiting examples of certain combinations are outlined above. It should also be understood that citations within each exhibit are exemplary, not exhaustive, and should not be construed as the sole evidentiary support in the reference.

VI. P.R. 3-3(d): INVALIDITY BASED ON INDEFINITENESS, LACK OF ENABLEMENT, AND LACK OF WRITTEN DESCRIPTION

Pursuant to Local P.R. 3-3(d), and subject to Defendants' reservation of rights, Defendants include below the grounds on which Defendants contend that the Asserted Claims of the Asserted Patents are invalid based on indefiniteness, lack of written description, and/or lack of enablement under pre- and/or post-AIA 35 U.S.C. § 112.

As noted above, Headwater has not yet provided a claim construction for any of the terms and phrases that Defendants anticipate will be in dispute. Defendants, therefore, cannot provide a complete list of its indefiniteness, lack of written description, and lack of enablement defenses because Defendants do not know whether Headwater will proffer a construction for certain terms and phrases that is broader than, or inconsistent with, the construction that would be supportable by the disclosure set forth in the specification. Accordingly, Defendants reserve the right, to the extent permitted by the Court and the applicable statutes and rules, to supplement, amend, and/or modify these indefiniteness, lack of written description, and lack of enablement defenses as discovery progresses and in accordance with Headwater's claim construction, infringement and validity disclosures.

A. Indefiniteness

Both the pre-AIA 35 U.S.C. § 112, ¶ 2 and post-AIA 35 U.S.C. § 112(b) contain two requirements: "first, [the claim] must set forth what the applicant regards as his invention and second, it must do so with sufficient particularity and distinctness, i.e., the claim must be sufficiently definite." *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002) (internal quotes removed) (quoting *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1377 (Fed. Cir. 2000)). See also *Justacomm-Texas Software, LLC, v. Axway, Inc.*, Case No. 6:10-cv-00011-LED, Dkt. No. 1079 at 6 (E.D. Tex. July 5, 2012). "A determination of whether a claim

recites the subject matter which the applicant regards as his invention and is sufficiently definite, so as to satisfy the requirements of 35 U.S.C. § 112, ¶ 2, is a legal conclusion” *Allen Eng’g*, 299 F.3d at 1343. Under the first requirement of pre-AIA § 112, ¶ 2 and post-AIA § 112(b), a court must hold a claim invalid “[w]here it would be apparent to one of skill in the art, based on the specification, that the invention set forth in [the] claim is not what the patentee regarded as his invention.” *Id.* at 1349.

Under the second requirement of pre-AIA § 112, ¶ 2 and post-AIA § 112(b), a claim is sufficiently definite only if, viewed in light of the specification and prosecution history, they inform those skilled in the art about the scope of the invention with reasonable certainty. *Nautilus, Inv. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910-911 (2014). Various Asserted Claims identified below of the Asserted Patents do not comply with the requirements of pre-AIA 35 U.S.C. § 112, ¶ 2 and/or post-AIA 35 U.S.C. § 112(b), for failing to particularly point out and distinctly claim “the subject matter which the applicant regards as his invention” for the following reasons. For example, as demonstrated either individually or collectively by the claim elements addressed below, various Asserted Claims fail to inform those skilled in the art about the scope of the invention with reasonable certainty, rendering those claims (and any claims depending therefrom) invalid as indefinite.⁵

<u>Claim Terms of the ’868 Patent</u>	<u>Asserted Claims of the ’868 Patent</u>
“link qualities” or “link quality” or “LQ” or “LQs”	1, 2-7, 16, 17, 20, 21, 24, 25, 27, 29, 33, 34
“positionings”	1, 20, 22-24, 33, 34
“information associated with the plurality of LQs”	1-3, 24, 33, 34

⁵ Defendants’ analysis is preliminary, and Defendants reserve the right to argue for constructions other than “indefinite” terms identified below.

<u>Claim Terms of the '868 Patent</u>	<u>Asserted Claims of the '868 Patent</u>
“wherein at least one of the future LQ or the plurality of LQs is associated with a wireless communication technology”	2-6
“UE usage information”	9, 10
“wherein at least a portion of the link quality positioning information is based on the UE usage information”	9, 11
“UE environment information”	11-13, 15, 30, 31
“wherein at least a portion of the link quality positioning information is based on the UE environment information”	11
“information associated with surrounding objects”	13
“information associated with a user of the UE”	13, 31
“assisting determining the UE environment information”	15
“neighboring LQs”	25-27, 29
“neighboring positioning”	24, 26, 27, 29, 30
“link quality neighboring positioning information”	29, 30
“controller”	33

<u>Claim Terms of the '502 Patent</u>	<u>Asserted Claims of the '502 Patent</u>
“directly”	1, 28, 30, 31
“data network”	1, 9, 19, 27-31, 35, 40-43
“backhaul user equipment” or “bUE”	1-7, 10, 12, 13, 16, 19-22, 24-28, 30-34, 36, 37, 39-46
“network connect[s]”	1, 28, 30, 31 40, 43
“a selectable one of to”	1, 28, 30
“aid in selecting a transmission power level,” “aiding in selecting a transmission power level,” and “aiding, by the BS, in selecting a transmission power level”	1, 13, 28, 30, 31, 40, 43
“client side modem functionality”	5
“first parameters associated with the wireless communication with the wireless communication between one or more of the plurality of bUE devices and the BS”	6, 27, 33, 44

<u>Claim Terms of the '502 Patent</u>	<u>Asserted Claims of the '502 Patent</u>
“one or more second parameters of associated with the second data network through at least the second communication technology” and “one or more second parameters associated with the second data network through at least the second communication technology”	9, 19, 35
“data flow parameter”	12, 37
“one or more UE devices is assisted by a signal transmitted by the BS”	13
“better antenna gain”	16
“better processing power”	16
“better transmit or receive analog or digital performance”	16
“outdoor installation” and “higher or outdoor installation”	16
“improved link parameters”	16
“improved number of antennas”	16
“low transmit power level”	24
“high transmit power level”	24
“dynamically added to or deleted”	27
“means for communicating directly with a first data network”	31
“means for wirelessly communicating with each of a plurality of backhaul user equipment (bUE) devices through at least a first communication technology”	31
“means for wirelessly communicating with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices or to the first data network through a third communication technology”	31
“means for transmitting resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices”	31
“communicate a second data network through at least a second communication technology”	40
“receive from the BS transmit resource block (RB) scheduling information for the BH traffic”	40
“process BH traffic header information based on the second data network through the at least a second communication technology”	41

The above limitations of the Asserted Claims of the Asserted Patents, even when read in light of the respective specifications and prosecution histories, fail to inform with reasonable certainty one of ordinary skill in the art about the scope of the invention. The lack of reasonably ascertainable scope of these limitations is compounded by Headwater's overbroad and vague infringement contentions, which outside of claim 1 of each Asserted Patent, do little other than refer back to claim 1. Thus, the Asserted Claims of the Asserted Patents fail to distinctly claim the subject matter that the applicant regards as his invention, and are invalid under 35 U.S.C. § 112(b). *See Nautilus*, 572 U.S. at 908-13.

B. Lack of Written Description

The Asserted Claims are invalid for failure to comply with the written description requirement under pre-AIA 35 U.S.C. § 112, ¶ 1 and/or post-AIA 35 U.S.C. § 112(a). To satisfy the written description requirement, the description must “clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date. *Id.*

The test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed. “Whether the written description requirement is satisfied is a fact-based inquiry that will depend on the nature of the claimed invention and the knowledge of one skilled in the art at the time an invention is made and a patent application is filed.” *Carnegie Mellon Univ. v. Hoffmann La Roche Inc.*, 541 F.3d 1115, 1122 (Fed. Cir. 2008).

Actual “possession” or reduction to practice outside of the specification is not enough. Rather, as stated above, it is the specification itself that must demonstrate possession. Moreover, while the description requirement does not demand any particular form of disclosure, *id.*, or that the specification recite the claimed invention *in haec verba*, a description that merely renders the invention obvious does not satisfy the requirement. *Lockwood v. Am. Airlines*, 107 F.3d 1565, 1571–72 (Fed. Cir. 1997).

For example, at least under Headwater’s apparent interpretation and application of the Asserted Claims, the Asserted Patents do not contain written description support at least for the following claim terms, either individually or collectively, rendering the Asserted Claims in which they appear (and any claims depending therefrom) invalid for lack of written description.

<u>Claim Terms of the '868 Patent</u>	<u>Asserted Claims of the '868 Patent</u>
“link quality” or “link qualities” or “LQ” or “LQs”	1, 2-7, 16, 17, 20, 21, 24, 25, 27, 29, 33, 34
“estimating a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE”	1, 24, 33, 34
“allocating a resource to a UE link, wherein the allocation of the resource to the UE link is based on the estimated future LQ”	16
“estimating one or more neighboring link qualities (LQs) of the UE at the at least one neighboring positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE”	24
“estimating a future link quality (LQ) of the second UE at the at least one future positioning of the second UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the one or more UE”	34

<u>Claim Terms of the '502 Patent</u>	<u>Asserted Claims of the '502 Patent</u>
“directly with a first data network” and “directly to a first data network”	1, 28, 30, 31
“backhaul user equipment” or “bUE”	1-7, 10, 12, 13, 16, 19-22, 24-28, 30-34, 36, 37, 39-46
“the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology”	1, 28, 30, 31, 40, 43
“selecting, one or more of the plurality of bUE devices for backhaul (BH) traffic,” or “through a selectable one of to the second data network through the one or more of the plurality of bUE devices”	1, 28, 30, 31, 40, 43
“aid in selecting a transmission power level,” “aiding in selecting a transmission power level,” and “aiding, by the BS, in selecting a transmission power level”	1, 13, 28, 30, 31
“client side modem functionality”	5
“one or more second parameters of associated with the second data network through at least the second communication technology” and “one or more second parameters associated with the second data network through at least the second communication technology”	9, 19, 35
“selecting the plurality of bUE devices such that at least one of the one or more UE devices has an associated bUE, thereby enabling joint or simultaneous wireless communication”	22
“means for communicating directly with a first data network”	31
“means for wirelessly communicating with each of a plurality of backhaul user equipment (bUE) devices through at least a first communication technology”	31
“means for wirelessly communicating with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices or to the first data network through a third communication technology”	31
“means for transmitting resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices”	31
“communicate a second data network through at least a second communication technology”	40

<u>Claim Terms of the '502 Patent</u>	<u>Asserted Claims of the '502 Patent</u>
“receive from the BS transmit resource block (RB) scheduling information for the BH traffic”	40
“process BH traffic header information based on the second data network”	41
“further operative to send or receive a traffic intended for the bUE, wherein the bUE selects between wirelessly communicating the traffic with the BS or communicating the traffic with the second data network through the at least second communication technology”	42

One of ordinary skill in the art at the time of the alleged invention would not have understood the applicants to be in possession of an invention comprising numerous of the limitations of the Asserted Claims of the Asserted Patents. At a minimum, the specifications do not adequately describe at least the claim terms listed above in a manner that demonstrates the applicants were in possession of the claimed subject matter. Accordingly, the Asserted Claims that contain these terms (identified above) are invalid for a lack of written description.

C. Lack of Enablement

The Asserted Claims are invalid for failure to comply with the enablement requirement under pre-AIA 35 U.S.C. § 112, ¶ 1 and/or post-AIA 35 U.S.C. § 112(a). To satisfy the enablement requirement of 35 U.S.C § 112, ¶ 1, the disclosure “must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’” *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008). Moreover, “[i]t is the specification, not the knowledge of one skilled in the art that must supply the novel aspects of the invention in order to constitute adequate enablement.” *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997). The Federal Circuit has enumerated several factors to consider in determining whether a disclosure would require “undue experimentation”: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance presented; (3) the presence or absence of

working examples; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (7) the predictability or unpredictability of the art; and (8) the breadth of the claims. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

For example, at least under Headwater’s apparent interpretation and application of the Asserted Claims, the respective specifications of the Asserted Patents does not teach those skilled in the art how to make and use the full scope of the claimed inventions without undue experimentation, rendering the Asserted Claims in which they appear (and any claims depending therefrom) invalid for lack of enablement.

<u>Claim Terms of the '868 Patent</u>	<u>Asserted Claims of the '868 Patent</u>
“link quality” or “link qualities” or “LQ” or “LQs”	1, 2-7, 16, 17, 20, 21, 24, 25, 27, 29, 33, 34
“estimating a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE”	1, 24, 33, 34
“allocating a resource to a UE link, wherein the allocation of the resource to the UE link is based on the estimated future LQ”	16
“estimating one or more neighboring link qualities (LQs) of the UE at the at least one neighboring positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE”	24
“estimating a future link quality (LQ) of the second UE at the at least one future positioning of the second UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the one or more UE”	34

<u>Claim Terms of the '502 Patent</u>	<u>Asserted Claims of the '502 Patent</u>
“directly with a first data network” and “directly to a first data network”	1, 28, 30, 31

<u>Claim Terms of the '502 Patent</u>	<u>Asserted Claims of the '502 Patent</u>
“backhaul user equipment” or “bUE”	1-7, 10, 12, 13, 16, 19-22, 24-28, 30-34, 36, 37, 39-46
“the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology”	1, 28, 30, 31, 40, 43
“selecting, one or more of the plurality of bUE devices for backhaul (BH) traffic,” or “through a selectable one of to the second data network through the one or more of the plurality of bUE devices”	1, 28, 30, 31, 40, 43
“aid in selecting a transmission power level,” “aiding in selecting a transmission power level,” and “aiding, by the BS, in selecting a transmission power level”	1, 13, 28, 30, 31
“client side modem functionality”	5
“one or more second parameters of associated with the second data network through at least the second communication technology” and “one or more second parameters associated with the second data network through at least the second communication technology”	9, 19, 35
“selecting the plurality of bUE devices such that at least one of the one or more UE devices has an associated bUE, thereby enabling joint or simultaneous wireless communication”	22
“means for communicating directly with a first data network”	31
“means for wirelessly communicating with each of a plurality of backhaul user equipment (bUE) devices through at least a first communication technology”	31
“means for wirelessly communicating with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices or to the first data network through a third communication technology”	31
“means for transmitting resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices”	31
“communicate a second data network through at least a second communication technology”	40
“receive from the BS transmit resource block (RB) scheduling information for the BH traffic”	40

<u>Claim Terms of the '502 Patent</u>	<u>Asserted Claims of the '502 Patent</u>
“process BH traffic header information based on the second data network”	41
“further operative to send or receive a traffic intended for the bUE, wherein the bUE selects between wirelessly communicating the traffic with the BS or communicating the traffic with the second data network through the at least second communication technology”	42

At a minimum, the Asserted Patents’ specifications do not enable one of ordinary skill in the art to practice the full scope of the Asserted Claims without undue experimentation. Given the lack of direction or guidance in the Asserted Patents’ specifications, a person of ordinary skill in the art would require significant experimentation in order to practice the full scope of the Asserted Claims of the Asserted Patents. Accordingly, claims 1-34 of the '868 Patent and claims 1-46 of the '502 Patent are invalid for lack of enablement under the first paragraph of 35 U.S.C. § 112.

VII. ADDITIONAL GROUNDS OF INVALIDITY AND/OR UNENFORCEABILITY

Pursuant to the Court’s Standing Order Regarding Subject Matter Eligibility Contentions, Defendants provide their contentions that all Asserted Claims are invalid as being directed to a patent-ineligible abstract idea without an inventive concept that would transform the claim into patent-eligible subject matter, in contravention of the requirements of 35 U.S.C. § 101. *See generally Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347 (2014). Defendants make these disclosures based on the current state of discovery and before expert discovery. Defendants reserve the right to disclose expert testimony related to patent eligibility according to the schedule in this litigation.

1. Identification of Each Exception to Eligibility to Which Each Accused Claim Is Directed

<u>Asserted Patent</u>	<u>Asserted Claim(s)</u>	<u>Exception to Eligibility</u>	<u>Factual and Legal Basis</u>
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US 9,094,868	1-34	Directed to abstract idea	Defendants incorporate by reference the below discussion concerning 35 U.S.C. § 101
US 9,413,502	1-46	Directed to abstract idea	Defendants incorporate by reference the below discussion concerning 35 U.S.C. § 101

An extended claim-by-claim analysis is not necessary where the claims are “substantially similar and linked to the same abstract idea.” *Content Extraction and Transmission, LLC v. Wells Fargo Bank, Nat. Ass’n*, 776 F.3d 1343, 1348 (Fed Cir. 2014); *see also Alice*, 134 S.Ct. at 2359 (finding a single method claim “representative” of all claims across four patents). Asserted independent claim 1 of the ’868 Patent is substantially similar to asserted claims 2-34 for purposes of a § 101 analysis, and is therefore a suitable representative claim. Asserted independent claim 1 of the ’502 Patent is substantially similar to asserted claims 2-46 for purposes of a § 101 analysis, and is therefore a suitable representative claim. The Asserted Claims “contain only minor differences in terminology [and] require performance of the same basic process” and, therefore, “should rise or fall together.” *Accenture Glob. Servs. v. GuideWire Software, Inc.*, 728 F.3d 1336, 1344 (Fed. Cir. 2013) (citations omitted); *see also Planet Bingo, LLC v. VKGS LLC*, 576 Fed. App’x. 1005, 1007 (Fed. Cir. 2014) (“The system claims recite the same basic process as the method claims, and the dependent claims recite only slight variations of the independent claims.”). The charts below highlights the insubstantial differences between the independent claims of the Asserted Patents:

<u>Asserted Claim 1 of the '868 Patent</u>	<u>Asserted Claim 24 of the '868 Patent</u>
1. A method, comprising: determining a plurality of link qualities (LQs) of a user equipment (UE) for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE; storing information associated with the plurality of LQs for the plurality of positionings; estimating at least one future positioning of the UE; and estimating a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE.	24. A method, comprising: determining a plurality of link qualities (LQs) of a user equipment (UE) for a plurality of positionings of the UE, wherein at least one of the plurality positioning includes at least a location or an orientation of the UE; storing information associated with the plurality of LQs for the plurality of positionings; estimating at least a positioning of the UE; determining at least one neighboring positioning of the positioning of the UE; and estimating one or more neighboring link qualities (LQs) of the UE at the at least one neighboring positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE.
<u>Asserted Claim 1 of the '868 Patent</u>	<u>Asserted Claim 33 of the '868 Patent</u>
1. A method, comprising: determining a plurality of link qualities (LQs) of a user equipment (UE) for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE;	33. A user equipment (UE), the UE comprising: a transceiver operative to communicate with a link partner device through a communication link, wherein the communication link includes a link quality; a controller, the controller operative to: determine a plurality of link qualities (LQs) of the UE for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE; store information associated with the

storing information associated with the plurality of LQs for the plurality of positionings; estimating at least one future positioning of the UE; and estimating a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE.	plurality of LQs for the plurality of positionings; estimate at least one future positioning of the UE; and estimate a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE.
<u>Asserted Claim 1 of the '868 Patent</u>	<u>Asserted Claim 34 of the '868 Patent</u>
1. A method, comprising: determining a plurality of link qualities (LQs) of a user equipment (UE) for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE; storing information associated with the plurality of LQs for the plurality of positionings; estimating at least one future positioning of the UE; and estimating a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE.	34. A method, comprising: determining a plurality of link qualities (LQs) of one or more user equipment (UE) for a plurality of positionings of the one or more UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of a first UE of the one or more UE; storing information associated with the plurality of LQs for the plurality of positionings; estimating at least one future positioning of a second UE; and estimating a future link quality (LQ) of the second UE at the at least one future positioning of the second UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the one or more UE.

<u>Asserted Claim 1 of the '502 Patent</u>	<u>Asserted Claim 28 of the '502 Patent</u>
1. A system comprising:	28. A system comprising:

a base station (BS) operable to communicate directly with a first data network; a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network; the BS operative to: wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through a third communication technology; communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic from the one or more UE devices; aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.	a base station (BS) operative to directly communication with a first data network; a backhaul user equipment (bUE) device, the bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the bUE device operable to communicate with a second data network through at least a second communication technology; the BS operative to: communicate with the first data network over at least a third communication technology; wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through the third communication technology; communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic associated with the one or more UE devices; aid in selecting a transmission power level of at least one of the bUE devices, and at least one of the one or more UE devices; and transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.
<u>Asserted Claim 1 of the '502 Patent</u>	<u>Asserted Claim 30 of the '502 Patent</u>

1. A system comprising: a base station (BS) operable to communicate directly with a first data network; a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network; the BS operative to: wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through a third communication technology; communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic from the one or more UE devices; aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the	30. A system comprising: a base station (BS) operative to communicate directly with a first data network; a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network; the BS operative to: communicate with the first data network through at least a third communication technology; wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the first data network or the second data network through one or more of the plurality of bUE devices or the third communication technology; communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first network through the third communication technology wherein the BH traffic comprises access traffic associated with the one or more UE devices; aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access
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access traffic of at least one of the one or more UE devices.	traffic of at least one of the one or more UE devices.
<u>Asserted Claim 1 of the '502 Patent</u>	<u>Asserted Claim 31 of the '502 Patent</u>
1. A system comprising: a base station (BS) operable to communicate directly with a first data network; a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network; the BS operative to: wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through a third communication technology; communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic from the one or more UE devices; aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the	31. A base station, comprising: means for communicating directly with a first data network; means for wirelessly communicating with each of a plurality of backhaul user equipment (bUE) devices through at least a first communication technology, wherein the plurality of bUE devices are each operable to communicate with a second data network through at least a second communication technology; means for wirelessly communicating with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices or to the first data network through a third communication technology; a controller operative to select one or more of the plurality of bUE devices for backhaul (BH) traffic to the second data network or the BS for BH traffic directly to the first data network, wherein the BH traffic comprises access traffic associated with the one or more UE devices; the controller operative to aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and means for transmitting resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices

access traffic of at least one of the one or more UE devices.	and the access traffic of at least one of the one or more UE devices.
<u>Asserted Claim 1 of the '502 Patent</u>	<u>Asserted Claim 40 of the '502 Patent</u>
1. A system comprising: a base station (BS) operable to communicate directly with a first data network; a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network; the BS operative to: wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through a third communication technology;	40. A backhaul user equipment (bUE) device the bUE device operative to: wirelessly communicate with a base station (BS); communicate a second data network through at least a second communication technology; wherein the bUE device is one of a plurality of bUE devices, wherein each of the bUE devices is also operable to communicate with second data network; the bUE further operative to: be selected from the plurality of bUE devices for backhaul (BH) traffic to the second data network, wherein the BH traffic comprises access traffic associated with one or more UE devices; receive from the BS a signal for aiding in selecting a transmission power level; receive from the BS transmit resource block (RB) scheduling information for the BH traffic; wherein the BS wirelessly communicates with the one or more user equipment (UE) devices, and network connects the one or more UE devices to the second data network through one or more of the plurality of bUE devices or to a first data network through a third communication technology, wherein the first data network is different than the second data network.

communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic from the one or more UE devices; aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.	
<u>Asserted Claim 1 of the '502 Patent</u>	<u>Asserted Claim 43 of the '502 Patent</u>
1. A system comprising: a base station (BS) operable to communicate directly with a first data network; a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network; the BS operative to: wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through a third communication technology;	43. A method of providing backhaul, comprising: wirelessly communicating, by at least one of a plurality of backhaul user equipment (bUE) devices, with a base station (BS) through at least a first communication technology; communicating, by at least one of the plurality of bUE devices, with a second data network through at least a second communication technology; wirelessly communicating, by the BS, with one or more user equipment (UE) devices, and network connecting the one or more UE devices to the a second data network through one or more of the plurality of bUE devices or to a first data network through a third communication technology, wherein the

communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic from the one or more UE devices; aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.	second data network is different than the first data network; selecting, one or more of the plurality of bUE devices for backhaul (BH) traffic to the second data network or the BS for BH traffic to the first data network, wherein the BH traffic comprises access traffic associated with the one or more UE devices; aiding, by the BS, in selecting a transmission power level of at least one of the plurality of bUE devices, or at least one of the one or more UE devices; and transmitting, by the BS, resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.
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The dependent claims of the Asserted Patents are also all directed to the same abstract ideas. Claims 2-23 of the '868 Patent depend from claim 1 of the '868 Patent, and each of those claim the same abstract idea with only minor additions: modifying what data is being collected and analyzed (claims 2-6, 22, 23); collecting and/or analyzing additional data (claims 7- 15, 19, 20); and transmitting data based on the collected and analyzed information (claims 16- 18, 21). As noted above, claim 24 of the '868 Patent is nearly identical to claim 1 of the '868 Patent, and this is also true with regard to its dependent claims. None of these additional claim limitations change the focus of the claims: collecting, analyzing, and transmitting data.

Claims 2-27 of the '502 Patent depend from claim 1 of the '502 Patent, and each of those claim the same abstract idea with only minor additions: modifying what/how data is transmitted (claims 2-5, 14-16, 23-26); and modifying how data is collected and/or analyzed (claims 6-13, 17-22, 27). As noted above, claims 28, 31, 40, and 43 of the '502 Patent are nearly

identical to the claim 1 of the '502 Patent, and this is also true for their dependent claims. None of these additional claim limitations change the focus of the claims: collecting, analyzing, and transmitting data.

2. The Asserted Claims Are Ineligible Under 35 U.S.C. § 101

To be subject-matter eligible, Section 101 provides that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101. The provision, however, “contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S.Ct. 2347, 2354 (2014). A claim thus falls outside § 101 when (1) it is “directed to” one of the patent-ineligible exceptions and, (2) if so, the particular elements of the claim, considered “both individually and ‘as an ordered combination,’” do not add enough to “‘transform the nature of the claim’ into a patent-eligible application.” *Id.* at 2355. *See also Mayo Collaborative Services, DBA Mayo Medical Laboratories, et al. v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 78-79 (2012).

The first stage of the *Alice* inquiry looks at the “focus” of the claims or their “character as a whole”; and the second stage of the inquiry (where reached) looks more precisely at what the claim elements add—specifically, whether, in the Supreme Court’s terms, they identify an “inventive concept” in the application of the ineligible subject matter to which (by assumption at stage two) the claim is directed. *Elec. Power Grp. v. Alstom S.A.*, 830 F.3d 1350, 1353-56 (Fed. Cir. 2016) (quoting *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335-36 (Fed. Cir. 2016)).⁶ The Asserted Claims here are ineligible because they fail both steps of the *Alice* inquiry.

⁶ Concepts claimed can be “[g]roundbreaking, innovative, or even brilliant,” but that is not enough for patent subject-matter eligibility. *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569

a. *Alice Step One: The Asserted Claims of the '868 Patent Are Directed to an Abstract Idea*

Alice Step One considers “what the patent asserts to be the focus of the claimed advance over the prior art” to “determine whether the claim’s character as a whole is directed to ineligible subject matter.” *Simio, LLC v. FlexSim Software Prods., Inc.*, 983 F.3d 1353, 1359 (Fed. Cir. 2020) (citations and quotation marks omitted). For computer-related claims, the analysis is whether the claim focuses on a “specific means or method that improves the relevant technology,” which may pass muster under § 101, or on a “result or effect that itself is the abstract idea and merely invokes generic processes and machinery,” which will not. *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016) (citations and quotation marks omitted). *See also Elec. Power Grp.*, 830 F.3d at 1354 (“[T]he focus of the claims is not on such an improvement in computers as tools, but on certain independently abstract ideas that use computers as tools.”). “[T]o be directed to a patent-eligible improvement to computer functionality, the claims must be directed to an improvement to the functionality of the computer or network platform itself.” *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359, 1365 (Fed. Cir. 2020). That is not the case with regard to the Asserted Claims of the '868 Patent.

The Asserted Claims of the '868 Patent, as described herein, are directed to the abstract idea of collecting data (link qualities of a UE, UE position information) and analyzing that data (estimating a future UE positioning based on UE position information, estimating future link

U.S. 576, 591, (2013); *accord buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1352 (Fed. Cir. 2014). Nor is it enough for subject-matter eligibility that claimed concepts be novel and nonobvious in light of prior art, passing muster under 35 U.S.C. §§ 102 and 103. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 89-90 (2012); *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016) (“[A] claim for a new abstract idea is still an abstract idea. The search for a § 101 inventive concept is thus distinct from demonstrating § 102 novelty.”); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (same for obviousness).

quality based on estimated future UE positioning and UE link quality). The Federal Circuit consistently finds patent claims directed to the collection, transfer, analysis, and display of data, like the Asserted Claims, to be abstract and invalid. *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353-54 (Fed. Cir. 2016) (collecting cases); *see also, e.g., SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161 (Fed. Cir. 2018) (finding ineligible claims directed to selecting certain information, analyzing it using certain techniques, and reporting or displaying the results); *Sanderling Mgmt. Ltd. v. Snap Inc.*, 65 F.4th 698, 703 (Fed. Cir. 2023) (providing information “based on meeting a condition” held to be an invalid abstract idea).

To the extent the dependent claims are directed to the idea of transmitting or using data, then those claims are also directed to an abstract idea. *AI Visualize, Inc. v. Nuance Commc’ns, Inc.*, 97 F.4th 1371, 1378-79 (Fed. Cir. 2024) (steps of “storing data (VVD) on a server, accepting user requests to view a portion of that data (virtual views), checking for the location of all data needed for the virtual view, ‘creating’ image frames from any non-locally-stored virtual view data, transmitting all non-locally-stored image frames to the user, compiling all image frames, and sequentially displaying the image frames to the user” were directed to an abstract idea); *USC IP P’ship, L.P. v. Meta Platforms, Inc.*, No. 2022-1397, 2023 WL 5606977, at *3 (Fed. Cir. Aug. 30, 2023) (“The claimed concept of collecting and using intent data is not a technical solution to a technical problem”). This is a “familiar class of claims” directed to ineligible subject matter. *Elec. Power Grp.*, 830 F.3d at 1353.

Accordingly, the Asserted Claims of the ’868 Patent fail *Alice* Step One.

b. *Alice Step Two: The Asserted Claims of the ’868 Patent Fail to Recite Additional Elements Sufficient to Transform the Asserted Claims into Patent-Eligible Subject Matter*

“To save a patent at step two, an inventive concept must be evident in the claims[.]” *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017), and must be “sufficient

to transform the claimed abstract idea into a patent-eligible application[.]” *Alice*, 134 S. Ct. at 2357. Put differently, the claims “must include additional features” which “must be more than well-understood, routine, conventional activity.” *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014) (citations and internal quotation marks omitted). The analysis in *Alice* Step Two shifts from assessing the character of the claims “as a whole” to “more precisely . . . what the claim elements add – specifically, whether, in the Supreme Court’s terms, they identify an ‘inventive concept’ in the application of the ineligible matter to which . . . the claim is directed.” *Elec. Power Grp.*, 830 F.3d at 1353. *See Alice*, 134 S. Ct. at 1354 (explaining that step two involves scrutinizing “the claims more microscopically”). Merely using generic computer components to implement an abstract idea is insufficient to supply an inventive concept. *See, e.g., Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) (“use of a computer in an otherwise patent ineligible process for no more than its most basic function—making calculations or computations—fails to circumvent the prohibition against patenting abstract ideas and mental processes.”).

Here, the Asserted Claims include no inventive concept that is sufficient to transform them into a patent-eligible application. Indeed, independent claims 1, 24, and 34 fail to add any inventive technical features that go beyond the abstract idea at all, and can be accomplished in any way imaginable, by a computer or even the human mind. For instance, claim 1 discloses a method comprising:

- “[D]etermining a plurality of link qualities (LQs) of a user equipment (UE) for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE” and “storing information associated with the plurality of LQs for the plurality of positionings.”

However, determining a plurality of link qualities for a plurality of potential positionings of a user equipment and storing that information was generic and well-known in the prior art, and Claim 1 does not require a specific or inventive way of determining a plurality of link qualities for a plurality of potential positionings of a user equipment and storing that information. *See, e.g.*, Jarvinen at [0005] (“checking a database for transmission conditions of the communication link that are the most optimal”); Fox at 2:47-55 (“The controller may build and maintain a record of radio quality across a coverage area of the network”); Vargas-Hurlston at [0004, 0018] (base station collects transmissions across a geographic area and creates a database storing data that relates communication parameters to a geographic location); Wilhelm at [0020] (“the database is realized as a digital map which assigns link adaptation parameters to geographical regions on the map”); Astrom at [Abstract] (“The method comprises determining location information associated with a location of the device, querying a database using the determined location information, wherein the database stores a plurality of entries each comprising location information and corresponding network quality information”); Navda at [Abstract] (“The method includes receiving a signal quality profile for an area in which the device is located”).

- “[E]stimating at least one future positioning of the UE.” Again, without any requirements for how the future position of the user equipment is estimated, this step is generic and routine on its face, since estimating the location of a user equipment was well-known in the prior art. *See, e.g.*, Jarvinen at [0049] (“A short history of the movement of the mobile terminal may be stored into the memory unit

of the mobile terminal to enable prediction of the movement. The prediction of the geographical location the mobile terminal is moving to is carried out in order to change the transmission conditions, if necessary, to more optimal ones before the transmission quality suffers from degradation.”); Fox at 2:65:3-1; Vargas-Hurlston at [0004]; Winter at [Abstract] (“Mobile device locations may be predicted using real-time device location information, destination information, and location history”).

- “[E]stimating a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE.” Finally, this step is generic because it does not recite any specific or inventive way of estimating future link quality, and it was known to reference a radio quality map, using the estimated future location of the user equipment, to determine the expected radio conditions of the user equipment at the future position. *See, e.g.*, Jarvinen at cl. 2 (“The method of claim 1, further comprising . . . checking the database for the transmission conditions of the communication link that are the most optimal according to the determined optimality criterion for a geographical location associated with the predicted movement of the mobile terminal”); Fox at 2:55-65; 3:1-33; Vargas-Hurlston at [0004] (base station transmits communication parameters to user equipment based on the user equipment’s predicted future geographic location).

These claims do not purport to utilize unconventional components or technologies. Nor do they recite using conventional components in an unconventional manner. Instead, they recite the abstract idea in the most generic manner.

Claims do not provide a technical solution to technical problem where “[t]here is no recitation in the claim about how to create frames or virtual views, much less in a manner that would meaningfully support a technical solution to a technical problem in the prior art.” *AI Visualize*, 97 F.4th at 1378-79. The asserted claims do not discuss:

- *How* to determine a plurality of link qualities;
- *How* to store information with the plurality of link qualities;
- *How* to estimate the future positioning of the user equipment; or
- *How* to estimate the future link quality of the user equipment based on stored information.⁷

Thus, the claims 1, 24, 34, and their dependent claims recite nothing more than conventional components used in a conventional manner. *See AI Visualize*, 97 F.4th at 1378-79; *see also Splunk Inc. v. Cribl, Inc.*, 662 F. Supp. 3d 1029, 1046-47 (N.D. Cal. 2023) (“[N]either the claim language nor the specification language provides guidance on how the claims achieve their functional results. The Federal Circuit has repeatedly found claims that did ‘not sufficiently describe how to achieve these results in a non-abstract way’ to be directed to abstract ideas.”).

Independent claim 33, which claims a user equipment controller and transceiver capable of performing the claimed steps, also fails to add any inventive technical features that go beyond the abstract idea of collecting, analyzing, and transmitting data. According to claim 33, the steps are performed by a generic transceiver and controller. In fact, the specification states that the abstract idea of collecting data (i.e., determining a link quality) can be performed by any or all of “at least one of a controller of the base station 800, a controller of the UE device 820, a controller

⁷ Even if additional detail were included in the specification, “the specification cannot be used to import details from the specification if those details are not claimed. Even a specification full of technical details about a physical invention may nonetheless conclude with claims that claim nothing more than the broad law or abstract idea underlying the claims, thus preempting all use of that law or idea.” *ChargePoint v. SemaConnect*, 920 F.3d 759, 769 (Fed. Cir. 2019).

(not shown) associated with the system, or a combination of the listed controllers.” ’868 Patent at 24:46-50. “[I]t is not enough, for patent-eligibility purposes, to improve an abstract process by invoking a computer merely as a tool for carrying out that process.” *In re Rosenberg*, 813 F. App’x 594, 596-97 (Fed. Cir. 2020); *see also Bancorp Servs.*, 687 F.3d at 1278 (“use of a computer in an otherwise patent ineligible process for no more than its most basic function—making calculations or computations—fails to circumvent the prohibition against patenting abstract ideas and mental processes.”); *Affinity Labs. of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1262 (Fed. Cir. 2016) (claims were not a patent-eligible improvement in computer functionality because they simply used cellular telephones “as tools in the aid of a process focused on an abstract idea”); *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359, 1364–65 (Fed. Cir. 2020) (“[The asserted claims] merely recite reserving memory to ensure storage space is available for at least some advertising data. The specification is silent as to any specific structural or inventive improvements in computer functionality related to this claimed system. The only improvements identified in the specification are generic speed and efficiency improvements inherent in applying the use of a computer to any task. Therefore, the claimed invention is at most an improvement to the abstract concept of targeted advertising wherein a computer is merely used as a tool. This is not an improvement in the functioning of the computer itself.” (internal citations omitted)). And to the extent Headwater claims that its physical components make the Asserted Patents eligible, this fails. *See e.g., ChargePoint*, 920 F.3d 759 (Fed. Cir. 2019). Thus claim 33 also fails *Alice* Step Two.

a. Alice Step One: The Asserted Claims of the ’502 Patent Are Directed to an Abstract Idea

The Asserted Claims of the ’502 Patent, as described herein, are directed to the abstract idea of collecting and analyzing data (*i.e.*, selecting a bUE, to offload backhaul traffic through) and transmitting data (*i.e.*, transmitting backhaul traffic, RB scheduling information, and transmit

power control). The Federal Circuit consistently finds patent claims directed to the collection, transfer, and analysis of data, like the Asserted Claims, to be abstract and invalid. *Elec. Power Grp.*, 830 F.3d at 1353-54 (Fed. Cir. 2016) (collecting cases); *see, e.g., SAP Am., Inc.*, 898 F.3d 1161 ((finding ineligible claims directed to selecting certain information, analyzing it using certain techniques, and reporting or displaying the results); *Sanderling Mgmt. Ltd.*, 65 F.4th at 703 (providing information “based on meeting a condition” held to be an invalid abstract idea); *AI Visualize*, 97 F.4th at 1378-79 (steps of “storing data (VVD) on a server, accepting user requests to view a portion of that data (virtual views), checking for the location of all data needed for the virtual view, “creating” image frames from any non-locally-stored virtual view data, transmitting all non-locally-stored image frames to the user, compiling all image frames, and sequentially displaying the image frames to the user” were directed to an abstract idea); *USC IP P’ship, L.P.*, 2023 WL 5606977, at *3 (“The claimed concept of collecting and using intent data is not a technical solution to a technical problem”).

Accordingly, the Asserted Claims of the ’502 Patent fail *Alice* Step One.

b. Alice Step Two: The Asserted Claims of the ’502 Patent Fail to Recite Additional Elements Sufficient to Transform the Asserted Claims into Patent-Eligible Subject Matter

The Asserted Claims of the ’502 include no inventive concept that is sufficient to transform them into a patent-eligible application. These claims do not purport to utilize unconventional components or technologies. Nor do they recite using conventional components in an unconventional manner. Instead, they recite the abstract idea in the most generic manner.⁸ For instance:

⁸ “[T]he specification cannot be used to import details from the specification if those details are not claimed. Even a specification full of technical details about a physical invention may nonetheless conclude with claims that claim nothing more than the broad law or abstract idea

- Claim 1 discloses a base station communicates directly with a first data network. Base stations communicating with data networks was well-understood at the time.
- Claim 1 discloses that a plurality of backhaul user equipment wirelessly communicate with a base station and a second data network, and backhaul traffic is transmitted through the backhaul user equipment. However, backhaul user equipment were known at the time, as was the idea of offloading backhaul traffic through backhaul user equipment. *See, e.g.,* Li at [0029]; Ishii at 5:3-34. Indeed, the '502 Patent does not describe backhaul user equipment (“bUE”) in detail, but rather assumes that a person of ordinary skill in the art is already aware of bUE. *See generally* '502 Patent.
- Claim 1 also discloses selecting one of a plurality of backhaul equipment for use, *i.e.*, the abstract idea of analyzing data. However, this step is once again performed by a conventional component (base station) and the claim does not provide any detail on *how* a backhaul user equipment should be selected. Moreover, methods of selecting a preferred backhaul path were well-known at the time. *See, e.g.,* Tomici at 14:44-52, 15:6-27, 15:51-57, 16:28-48, 18:10-26, 19:18-46; Dayama at [0025, 27, 34-35].
- Claim 1 also discloses that the base station aids in selecting a transmission power level, which is again the abstract idea of analyzing data. This step is once again performed by a conventional component (base station) and the claim does not provide any detail on how the base station is to aid in selecting a transmission

underlying the claims, thus preempting all use of that law or idea.” *ChargePoint v. SemaConnect*, 920 F.3d 759, 769 (Fed. Cir. 2019).

power level. *See* 4G Evolution at 183, 185-87, 342-43, 339-41; LTE Theory to Practice at 202-06, 689-90, 692; Ishii at 14:60-15:21, 8:44-67, 14:10-39.

- Finally, claim 1 discloses that the base station transmits resource block scheduling information, *i.e.*, the abstract idea of transmitting data. This step is once again performed by a conventional component (base station) and the claim does not provide any detail on how the base station is to transmit resource block scheduling information. *See* 4G Evolution at 183, 185-87, 342-43, 339-41; LTE Theory to Practice at 202-06, 689-90, 692; Ishii at 14:60-15:21, 8:44-67, 14:10-39.

Thus, claim 1, which is representative, recites nothing more than conventional components used in a conventional manner. *See AI Visualize*, 97 F.4th at 1378-79 (claims did not provide technical solution to technical problem where “[t]here is no recitation in the claim about how to create frames or virtual views, much less in a manner that would meaningfully support a technical solution to a technical problem in the prior art”); *see also Splunk Inc.*, 662 F. Supp. 3d at 1046-47 (“[N]either the claim language nor the specification language provides guidance on how the claims achieve their functional results. The Federal Circuit has repeatedly found claims that did “not sufficiently describe how to achieve these results in a non-abstract way” to be directed to abstract ideas.”); *Bancorp Servs.*, 687 F.3d at 1278 (“use of a computer in an otherwise patent ineligible process for no more than its most basic function—making calculations or computations—fails to circumvent the prohibition against patenting abstract ideas and mental processes.”); *Affinity Labs.*, 838 F.3d at 1262 (claims were not a patent-eligible improvement in computer functionality because they simply used cellular telephones “as tools in the aid of a process focused on an abstract idea”); *Customedia Techs.*, 951 F.3d at 1364-65 (“[The asserted claims] merely recite reserving

memory to ensure storage space is available for at least some advertising data. The specification is silent as to any specific structural or inventive improvements in computer functionality related to this claimed system. The only improvements identified in the specification are generic speed and efficiency improvements inherent in applying the use of a computer to any task. Therefore, the claimed invention is at most an improvement to the abstract concept of targeted advertising wherein a computer is merely used as a tool. This is not an improvement in the functioning of the computer itself.” (internal citations omitted)).

Accordingly, the claims of the '502 Patent fail *Alice* Step Two.

3. Other Considerations

Other considerations support a finding that both asserted claims are ineligible subject matter and unpatentable under Section 101. For instance, while preemption is not the test for determining eligibility, it is the concern underlying the judicial exemption, and here we see why there is such a concern. As discussed above, the claims of the '868 Patent are directed to the abstract idea of storing link quality data corresponding to locations, predicting the future location of a user equipment, and predicting the future link quality of a user equipment based on the stored data and predicted future location without claiming, for example, how the analysis takes place. Instead, the claims preempt every possible way to predict the future link quality.

Likewise, the claims of the '502 Patent are directed to the abstract idea of analyzing data to select a backhaul user equipment and transferring data using the selected backhaul user equipment while utilizing commonplace, known components and technologies without claiming, for example, how the analysis takes place. Instead, the claims preempt every possible way to transmit data when there are a plurality of backhaul options.

Claims 1-34 of the '868 Patent and claims 1-46 of the '502 Patent are therefore ineligible for patent protection and thus invalid under § 101.

4. A Description of the Industry, at the Relevant Time, in Which the Asserted Claims Are Alleged to Be Well Understood, Routine, and Conventional

The following table contains references that show the state of the art as of the priority dates of the Asserted Patents, which shows that, at the time, the Asserted Claims were well understood, routine, and conventional.

Description of the industry, at the relevant time, in which the Asserted Claims of the '868 Patent are alleged to be well understood, routine, and conventional, and the factual and legal basis therefor

All of the references cited in these contentions, the '868 Patent itself, the references cited on the face the '868 Patent, the prosecution history of the '868 Patent, and references cited during the prosecution history of the '868 Patent.

References for this entry and in the table below show the state of the industry of at the time the '868 Patent was filed. The '868 Patent is directed to no more than collecting, analyzing, storing, and transmitting data. As of the priority date of the '868 Patent, the steps and components claimed in the Asserted Claims of the '868 Patent were conventional. The Asserted Claims of the '868 Patent include collecting link qualities of a UE, predicting the future position of a UE, and outputting the collected link quality based on the future position, all of which was well-understood and known at the time the '868 Patent was filed. The references show that these steps and components are all well-known and are not inventive.

Description of the industry, at the relevant time, in which the Asserted Claims of the '502 Patent are alleged to be well understood, routine, and conventional, and the factual and legal basis therefor

All of the references cited in these contentions, the '502 Patent itself, the references cited on the face the '502 Patent, the prosecution history of the '502 Patent, and references cited during the prosecution history of the '502 Patent.

References for this entry and in the table below show the state of the industry of wireless telecommunications. The '502 Patent is directed to no more than collecting, analyzing, and transmitting data. As of the priority date of the '502 Patent, the steps and components claimed in the Asserted Claims of the '502 Patent were conventional. The Asserted Claims of the '502 Patent include collecting, analyzing, and transmitting data using generic hardware (base station, backhaul user equipment) using generic methods. The references show that these steps and components are all well-known and are not inventive.

As discussed above, the limitations of the Asserted Claims of the '868 Patent comprise collecting, analyzing, storing, and transmitting. As shown in the chart below, each of the limitations of the Asserted Claims of the '868 Patent, individually and in combination with the other elements of each claim, was well understood, routine, and conventional, in the relevant industry at the relevant time:

'868 Patent Claim	Limitation	Description of the Industry
1[pre]	A method, comprising:	
1[a]	determining a plurality of link qualities (LQs) of a user equipment (UE) for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE;	Determining a plurality of link qualities of a user equipment for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-A.
1[b]	storing information associated with the plurality of LQs for the plurality of positionings;	Storing information associated with the plurality of LQs for the plurality of positionings was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-B.
1[c]	estimating at least one future positioning of the UE; and	Estimating at least one future positioning of the UE was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-C.
1[d]	estimating a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the	Estimating a future link quality of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-D.

'868 Patent Claim	Limitation	Description of the Industry
	plurality of LQs at the plurality of positionings of the UE.	
2	The method of claim 1, wherein at least one of the future LQ or the plurality of LQs comprises one or more of a path loss (PL), shadowing (S), interference (I), signal to noise ratio (SNR), signal to interference and noise ratio (SINR), signal to interference ratio (SIR), channel quality indicator (CQI), channel state information (CQI), packet error rate (PER).	<i>See disclosure at Limitations 1[a] and 1[d] above.</i>
3	The method of claim 1, wherein at least one of the future LQ or the information associated with the plurality of LQs is associated with an uplink or downlink transmission.	<i>See disclosure at Limitations 1[a] and 1[d] above.</i>
4	The method of claim 1, wherein at least one of the future LQ or the plurality of LQs is associated with a frequency band or a frequency channel.	<i>See disclosure at Limitations 1[a] and 1[d] above.</i>

'868 Patent Claim	Limitation	Description of the Industry
5	The method of claim 1, wherein at least one of the future LQ or the plurality of LQs is associated with a wireless communication technology.	<i>See</i> disclosure at Limitations 1[a] and 1[d] above.
6	The method of claim 1, wherein at least one of the future LQ or the plurality of LQs is associated with a link partner of the UE.	<i>See</i> disclosure at Limitations 1[a] and 1[d] above.
7	The method of claim 1, wherein a link quality positioning information includes at least one of the determined plurality of LQs, the stored information, the estimated future positioning or the estimated future LQ.	<i>See</i> disclosure at Limitations 1[a]-[d] above. <i>See, e.g.</i> , Disclosures cited in Appendices A-A to A-D.
8	The method of claim 7, wherein the UE obtains at least a portion of the link quality positioning information from a link partner or wherein the UE communicates the at least the portion of the link quality positioning	<i>See</i> disclosure at Limitations 1[a]-[d] above. <i>See, e.g.</i> , Disclosures cited in Appendix A-E.

'868 Patent Claim	Limitation	Description of the Industry
	information to the link partner.	
9	The method of claim 7, further comprising determining a UE usage information, wherein at least a portion of the link quality positioning information is based on the UE usage information.	See disclosure at Limitations 1[a]-[d] above. See, e.g., Disclosures cited in Appendix A-F.
10	The method of claim 9, wherein the UE usage information comprises UE information indicating one or more of a user handheld mode, a hands-free mode, a speaker phone mode, a car Bluetooth mode, a headset Bluetooth mode.	See disclosure at Claim 9 above.
11	The method of claim 7, further comprising determining a UE environment information, wherein at least a portion of the link quality positioning information is based on the UE environment information.	See disclosure at Claim 7 above. See, e.g., Disclosures cited in Appendix A-G.
12	The method of claim 11, wherein the UE	See disclosure at Claim 11 above.

'868 Patent Claim	Limitation	Description of the Industry
	environment information comprises information associated to one or more of a traffic load, a network load, an interference, time of day, whether information, day of year, season.	
13	The method of claim 11, wherein the UE environment information comprises information associated with surrounding objects or information associated with a user of the UE.	<i>See disclosure at Claim 11 above.</i>
14	The method of claim 13, wherein the information associated with the user of the UE includes positioning of the user of the UE or positioning of the user of the UE relative to the UE.	<i>See disclosure at Claim 13 above.</i>
15	The method of claim 11, further comprising assisting determining the UE environment information using sensors of the UE.	<i>See disclosure at Claim 11 above.</i>

'868 Patent Claim	Limitation	Description of the Industry
16	The method of claim 1, further comprising allocating a resource to a UE link, wherein the allocation of the resource to the UE link is based on the estimated future LQ.	Allocating a resource to a UE link, wherein the allocation of the resource to the UE link is based on the estimated future LQ was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-H.
17	The method of claim 1, further comprising selecting a transmission mode for a UE link, wherein the selecting the transmission mode for the UE link is based on the estimated future LQ.	Selecting a transmission mode for a UE link, wherein the selecting the transmission mode for the UE link is based on the estimated future LQ was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-I.
18	The method of claim 17, wherein the transmission mode comprises one or more of a modulation, a code, a modulation and coding scheme (MCS), a multiple input multiple output (MIMO) mode, a beamforming parameter, a transmit power.	<i>See</i> disclosure at Claim 17 above.
19	The method of claim 1, further comprising obtaining at least one future time, and wherein the estimating the at least one future	Obtaining at least one future time, and wherein the estimating the at least one future positioning is based on the at least one future time was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-J.

'868 Patent Claim	Limitation	Description of the Industry
	positioning is based on the at least one future time.	
20	The method of claim 1, further comprising a second plurality of positionings wherein the second plurality of positionings comprises the at least one future positioning, and further comprising estimating a second plurality of LQs based on the second plurality of positionings.	<i>See disclosure at Limitations 1[c] and 1[d] above.</i>
21	The method of claim 20, further comprising allocating a resource block (RB) to a UE link based on the estimated second plurality of LQs.	Allocating a resource block to a UE link based on the estimated second plurality of LQs was well known. <i>See, e.g., Disclosures cited in Appendix A-K.</i>
22	The method of claim 1, wherein the plurality of positionings is constrained to a physical area.	A plurality of positionings constrained to a physical area was well known. <i>See, e.g., Disclosures cited in Appendix A-L.</i>
23	The method of claim 1, wherein at least one of the plurality of positionings or the estimated at least one future positioning of the	<i>See disclosure at Limitations 1[a] and 1[c] above.</i>

'868 Patent Claim	Limitation	Description of the Industry
	UE further comprises at least one of an error, an accuracy, a deformation, a velocity, an acceleration.	
24[pre]	A method, comprising:	<i>See disclosure at Limitation 1[pre] above.</i>
24[a]	determining a plurality of link qualities (LQs) of a user equipment (UE) for a plurality of positionings of the UE, wherein at least one of the plurality positioning includes at least a location or an orientation of the UE;	<i>See disclosure at Limitation 1[a] above.</i>
24[b]	storing information associated with the plurality of LQs for the plurality of positionings;	<i>See disclosure at Limitation 1[b] above.</i>
24[c]	estimating at least a positioning of the UE;	<i>See disclosure at Limitation 1[c] above.</i>
24[d]	determining at least one neighboring positioning of the positioning of the UE; and	<i>See disclosure at Limitation 1[c] above.</i>
24[e]	estimating one or more neighboring link qualities (LQs)	<i>See disclosure at Limitation 1[d] above.</i>

'868 Patent Claim	Limitation	Description of the Industry
	of the UE at the at least one neighboring positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE.	
25	The method of claim 24, further comprising adjusting or changing a configuration of the UE based on the one or more neighboring LQs.	Adjusting or changing a configuration of the UE based on the one or more neighboring LQs was well known. <i>See, e.g.</i> , Disclosures cited in Appendix A-M.
26	The method of claim 24, further comprising presenting the one or more neighboring LQs of the UE at the at least one neighboring positioning.	Presenting the one or more neighboring LQs of the UE at the at least one neighboring positioning was well known. <i>See, e.g.</i> , Disclosures cited in Appendix A-N.
27	The method of claim 24, further comprising selecting a candidate positioning from the at least one neighboring positioning based on the one or more neighboring LQs.	Selecting a candidate positioning from the at least one neighboring positioning based on the one or more neighboring LQs was well known. <i>See, e.g.</i> , Disclosures cited in Appendix A-O.

'868 Patent Claim	Limitation	Description of the Industry
28	The method of claim 27, further comprising presenting the selected candidate positioning to a user of the UE.	Presenting the selected candidate positioning to a user of the UE was well known. <i>See, e.g.</i> , Disclosures cited in Appendix A-O.
29	The method of claim 24, wherein a link quality neighboring positioning information includes at least one of the determined plurality of LQs, the stored information, the estimated at least a positioning of the UE, the determined at least one neighboring positioning, or the one or more neighboring LQs.	<i>See disclosure at Claim 7 above.</i>
30	The method of claim 29, further comprising determining a UE environment information, wherein at least a portion of the link quality neighboring positioning information is based on the UE environment information.	<i>See disclosure at Claim 11 above.</i>
31	The method of claim 30, the UE	<i>See disclosure at Claim 13 above.</i>

'868 Patent Claim	Limitation	Description of the Industry
	environment information comprises information associated with a user of the UE.	
32	The method of claim 30, further comprising selecting a joint candidate positioning of the UE and a user of the UE, wherein the joint candidate positioning comprises a combination of a UE positioning and a user positioning relative to the UE.	Selecting a joint candidate positioning of the UE and a user of the UE, wherein the joint candidate positioning comprises a combination of a UE positioning and a user positioning relative to the UE was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-P.
33[pre]	A user equipment (UE), the UE comprising:	<i>See</i> disclosure at Limitation 1[a] above.
33[a]	a transceiver operative to communicate with a link partner device through a communication link, wherein the communication link includes a link quality;	A transceiver operative to communicate with a link partner device through a communication link, wherein the communication link includes a link quality was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-Q.
33[b]	a controller, the controller operative to:	A controller was well known. <i>See, e.g.,</i> Disclosures cited in Appendix A-R.

'868 Patent Claim	Limitation	Description of the Industry
33[c]	determine a plurality of link qualities (LQs) of the UE for a plurality of positionings of the UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of the UE;	<i>See disclosure at Limitation 1[a] above.</i>
33[d]	store information associated with the plurality of LQs for the plurality of positionings;	<i>See disclosure at Limitation 1[b] above.</i>
33[e]	estimate at least one future positioning of the UE; and	<i>See disclosure at Limitation 1[c] above.</i>
33[f]	estimate a future link quality (LQ) of the UE at the at least one future positioning of the UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the UE.	<i>See disclosure at Limitation 1[d] above.</i>
34[pre]	A method, comprising:	<i>See disclosure at Limitation 1[pre] above.</i>
34[a]	determining a plurality of link qualities (LQs) of one or more user equipment (UE) for	<i>See disclosure at Limitation 1[a] above.</i>

'868 Patent Claim	Limitation	Description of the Industry
	a plurality of positionings of the one or more UE, wherein at least one of the plurality of positionings includes at least a location or an orientation of a first UE of the one or more UE;	
34[b]	storing information associated with the plurality of LQs for the plurality of positionings;	<i>See disclosure at Limitation 1[b] above.</i>
34[c]	estimating at least one future positioning of a second UE; and	<i>See disclosure at Limitation 1[c] above.</i>
34[d]	estimating a future link quality (LQ) of the second UE at the at least one future positioning of the second UE based on the stored information associated with the plurality of LQs at the plurality of positionings of the one or more UE.	<i>See disclosure at Limitation 1[d] above.</i>

As discussed above, the limitations of the Asserted Claims of the '502 Patent comprise no more than collecting, analyzing, and transmitting data. As shown in the chart below, each of the limitations of the Asserted Claims of the '502 Patent, individually and in combination with the

other elements of each claim, was well understood, routine, and conventional, in the relevant industry at the relevant time:

'502 Patent Claim	Limitation	Description of the Industry
1[pre]	A system comprising:	
1[a]	a base station (BS) operable to communicate directly with a first data network;	A base station operable to communicate directly with a first data network was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-A.
1[b]	a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network;	A plurality of backhaul user equipment devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-B.
1[c]	the BS operative to: wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or	A BS operative to wirelessly communicate with one or more user equipment devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through a third communication technology was well known.

'502 Patent Claim	Limitation	Description of the Industry
	more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through a third communication technology;	<i>See, e.g.</i> , Disclosures cited in Appendix B-C.
1[d]	[the BS operative to:] communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic from the one or more UE devices;	Communicating backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first data network, wherein the BH traffic comprises access traffic from the one or more UE devices was well known. <i>See, e.g.</i> , Disclosures cited in Appendix B-D.
1[e]	[the BS operative to:] aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and;	Aiding in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices was well known. <i>See, e.g.</i> , Disclosures cited in Appendix B-E.
1[f]	[the BS operative to:] transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and	Transmitting resource block scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices was well known. <i>See, e.g.</i> , Disclosures cited in Appendix B-F.

'502 Patent Claim	Limitation	Description of the Industry
	the access traffic of at least one of the one or more UE devices.	
2	The system of claim 1, wherein the plurality of bUE devices wirelessly communicate with the BS over one or more of wireless communication technologies, wherein the one or more wireless communication technologies comprise at least one of WiFi, WiMax, 3G, 4G, LTE, Orthogonal frequency division multiple access (OFDMA), Wideband code division multiple access (WCDMA).	See disclosure at Limitation 1[b] above.
3	The system of claim 1, wherein the one or more UE devices wirelessly communicate with the BS and the plurality of bUE devices wirelessly communicate with the BS utilizing a same wireless communication technology.	See disclosure at Limitations 1[b] and 1[c] above.

'502 Patent Claim	Limitation	Description of the Industry
4	The system of claim 3, wherein the one or more UE devices wirelessly communicate with the BS, and the plurality of bUE devices wirelessly communicate with the BS utilizing the same wireless communication technology and a shared one or more frequency channels.	See disclosure at Limitations 1[b] and 1[c] above.
5	The system of claim 1, wherein at least one of the plurality bUE devices is at least one of associated with or a part of a small cell BS, wherein the small cell BS comprises client side modem functionality.	See disclosure at Limitation 1[b] above.
6	The system of claim 1, wherein the BS is further operative to obtain one or more first parameters associated with the wireless communication between one or more of the plurality of bUE devices and the BS.	Obtaining one or more first parameters associated with the wireless communication between one or more of the plurality of bUE devices and the BS was well known. See, e.g., Disclosures cited in Appendix B-G.

'502 Patent Claim	Limitation	Description of the Industry
7	The system of claim 6, wherein a selection of the one or more of the plurality of bUE devices for the BH traffic is based on the first parameters.	See disclosure at Claim 6 above.
8	The system of claim 6, wherein the one or more first parameters comprises one or more of a link quality, link quality statistics, link quality variation, path loss, fading, shadowing, Signal to Noise Ratio (SNR), Signal to Interference and Noise Ratio (SINR), Packet Error Rate (PER), received interference, interference generated to other devices, Channel Quality Indicator (CQI), Channel State Information (CSI), Modulation and Coding Scheme (MCS), Precoding Matrix Indicator (PMI), rank indicator (RI), single user or multiuser Multiple Input Multiple Output (SU-MIMO or MU-MIMO) information.	See disclosure at Claim 6 above.

'502 Patent Claim	Limitation	Description of the Industry
9	The system of claim 1, wherein the BS is further operative to obtain one or more second parameters associated with the second data network through at least the second communication technology.	Obtaining one or more second parameters associated with the second data network through at least the second communication technology was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-H.
10	The system of claim 9, wherein a selection of the one or more of the plurality of bUE devices for the BH traffic is based on the one or more second parameters.	<i>See</i> disclosure at Claim 9 above.
11	The system of claim 9, wherein the one or more second parameters comprise one or more of a link quality, bandwidth, throughput, cost, latency, jitter, QoS, PER.	<i>See</i> disclosure at Claim 9 above.
12	The system of claim 1, wherein the access traffic associated with the one or more UE devices is classified into two or more data flows based on a data flow parameter and the selection of the one or more plurality of	Access traffic associated with the one or more UE devices being classified into two or more data flows based on a data flow parameter and the selection of the one or more plurality of bUE devices for the BH traffic being based in part on the data flow parameter was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-I.

'502 Patent Claim	Limitation	Description of the Industry
	bUE devices for the BH traffic is based in part on the data flow parameter.	
13	The system of claim 1, wherein the BS operative to aid in selecting the transmission power level of at least one of the plurality of bUE devices, or the one or more UE devices is assisted by a signal transmitted by the BS.	<i>See disclosure at Limitation 1[e] above.</i>
14	The system of claim 1, wherein a resource block comprises a partition of a carrier or frequency channel for the wirelessly communicating.	<i>See disclosure at Limitation 1[f] above.</i>
15	The system of claim 14, wherein the partition comprises one or more of a unit of time, a unit of frequency, a code.	<i>See disclosure at Claim 14 above.</i>
16	The system of claim 1, wherein the wireless communication between the plurality of bUE devices and the BS is enhanced relative to the wireless communication	<i>See disclosure at Limitations 1[b] and 1[c] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	between the BS and at least one of the one or more UE devices, wherein the enhanced wireless communication comprises one or more of better antenna gain, more antennas, outdoor installation, better processing power, better transmit or receive analog or digital performance, lower transmit power, higher or outdoor installation, improved link parameters, improved number of antennas.	
17	The system of claim 1, further comprising classifying and prioritizing the BH traffic based on the access traffic, and wherein the RB scheduling information for the BH traffic is based on the BH traffic prioritization.	Classifying and prioritizing the BH traffic based on the access traffic, and RB scheduling information for the BH traffic being based on the BH traffic prioritization was well known. <i>See, e.g.</i> , Disclosures cited in Appendix B-J.
18	The system of claim 17, further comprising classifying and prioritizing the access traffic, wherein the RB	<i>See disclosure at Claim 17 above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	scheduling information for the access traffic and the BH traffic is based on the access traffic prioritization and BH traffic prioritization.	
19	The system of claim 1, wherein a bUE device selection of one or more of the plurality of bUE devices is based on one or more first parameters of the wireless communication between the bUE device and the BS or one or more second parameters of associated with the second data network through at least the second communication technology.	<i>See disclosure at Claims 6 and 9 above.</i>
20	The system of claim 19, wherein the first parameter of the bUE device selection is based on a joint first parameter between at least two of the plurality of bUE devices.	<i>See disclosure at Claim 6 above.</i>
21	The system of claim 20, wherein the joint first parameter enables joint or	<i>See disclosure at Claim 20 above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	simultaneous wireless communication on a shared resource block (RB) of at least two of the plurality of bUE devices.	
22	The system of claim 1, further comprising selecting the plurality of bUE devices such that at least one of the one or more UE devices has an associated bUE, thereby enabling joint or simultaneous wireless communication.	Selecting the plurality of bUE devices such that at least one of the one or more UE devices has an associated bUE, thereby enabling joint or simultaneous wireless communication was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-K.
23	The system of claim 22, wherein the joint wireless communication over the one or more shared RB comprises joint wireless communication utilizing one or more of communication separable in space, multilevel constellation, transmitter pre-coding or receiver separation.	<i>See disclosure at Claim 22 above.</i>
24	The system of claim 1, wherein the BS is one of a plurality of	A BS being one of a plurality of BSs, wherein the plurality of BSs are each assigned one or more frequency channels based on a soft frequency reuse scheme with at least a low

'502 Patent Claim	Limitation	Description of the Industry
	BSs, wherein the plurality of BSs are each assigned one or more frequency channels based on a soft frequency reuse (SFR) scheme with at least a low transmit power level and a high transmit power level, and wherein the plurality of bUE devices are assigned a resource block (RB) at the low transmit power level.	transmit power level and a high transmit power level, and the plurality of bUE devices being assigned a resource block at the low transmit power level was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-L.
25	The system of claim 1, wherein the BS is one of a plurality of BSs, wherein the plurality of BSs are each assigned one or more frequency channels based on a fractional frequency reuse (FFR) scheme and wherein the plurality of bUE devices are assigned a resource block (RB) having a higher frequency reuse than a resource block (RB) assigned to the one or more UE devices.	A BS being one of a plurality of BSs, wherein the plurality of BSs are each assigned one or more frequency channels based on a fractional frequency reuse scheme and the plurality of bUE devices being assigned a resource block having a higher frequency reuse than a resource block assigned to the one or more UE devices was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-M.
26	The system of claim 1, wherein at least a first bUE device of the plurality of bUE	<i>See</i> disclosure at Limitation 1[b] above.

'502 Patent Claim	Limitation	Description of the Industry
	devices transmits or receives access traffic associated with the first bUE.	
27	The system of claim 1, wherein a first bUE device is dynamically added to or deleted from the plurality of bUE devices based on one or more first parameters associated with the wireless communication between the first bUE device and the BS or one or more second parameters associated with second data network through at least the second communication technology associated with the first bUE device.	A first bUE device dynamically added to or deleted from the plurality of bUE devices based on one or more first parameters associated with the wireless communication between the first bUE device and the BS or one or more second parameters associated with second data network through at least the second communication technology associated with the first bUE device was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-N.
28[pre]	A system comprising:	<i>See disclosure at Limitation 1[pre] above.</i>
28[a]	a base station (BS) operative to directly communication with a first data network;	<i>See disclosure at Limitation 1[a] above.</i>
28[b]	a backhaul user equipment (bUE) device, the bUE devices operable to wirelessly communicate with the BS through at	<i>See disclosure at Limitation 1[b] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	least a first communication technology, and the bUE device operable to communicate with a second data network through at least a second communication technology;	
28[c]	the BS operative to: communicate with the first data network over at least a third communication technology;	<i>See disclosure at Limitation 1[c] above.</i>
28[d]	[the BS operative to:] wirelessly communicate with one or more user equipment (UE) devices, and network connect the one or more UE devices to the second data network through one or more of the plurality of bUE devices, or directly to the first data network through the third communication technology;	<i>See disclosure at Limitation 1[c] above.</i>
28[e]	[the BS operative to:] communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly	<i>See disclosure at Limitation 1[d] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	to the first data network, wherein the BH traffic comprises access traffic associated with the one or more UE devices;	
28[f]	[the BS operative to:] aid in selecting a transmission power level of at least one of the bUE devices, and at least one of the one or more UE devices; and	<i>See disclosure at Limitation 1[e] above.</i>
28[g]	[the BS operative to:] transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.	<i>See disclosure at Limitation 1[f] above.</i>
29	The system of claim 28, wherein the BS is further operative to obtain one or more third parameters associated with the first data network through at least the third communication technology.	<i>See disclosure at Limitation 28[c] above.</i> <i>See also disclosures cited in Appendix B-C.</i>

'502 Patent Claim	Limitation	Description of the Industry
30[pre]	A system comprising:	<i>See disclosure at Limitation 1[pre] above.</i>
30[a]	a base station (BS) operative to communicate directly with a first data network;	<i>See disclosure at Limitation 1[a] above.</i>
30[b]	a plurality of backhaul user equipment (bUE) devices, each of the plurality of bUE devices operable to wirelessly communicate with the BS through at least a first communication technology, and the plurality of bUE devices each operable to communicate with a second data network through at least a second communication technology, wherein the second data network is different than the first data network;	<i>See disclosure at Limitation 1[b] above.</i>
30[c]	the BS operative to: communicate with the first data network through at least a third communication technology;	<i>See disclosure at Limitation 1[c] above.</i>
30[d]	[the BS operative to:] wirelessly communicate with one or more user equipment (UE)	<i>See disclosure at Limitation 1[c] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	devices, and network connect the one or more UE devices to the first data network or the second data network through one or more of the plurality of bUE devices or the third communication technology;	
30[e]	[the BS operative to:] communicate backhaul (BH) traffic through a selectable one of to the second data network through the one or more of the plurality of bUE devices, and directly to the first network through the third communication technology wherein the BH traffic comprises access traffic associated with the one or more UE devices;	<i>See disclosure at Limitation 1[d] above.</i>
30[f]	[the BS operative to:] aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and	<i>See disclosure at Limitation 1[e] above.</i>
30[g]	[the BS operative to:]	<i>See disclosure at Limitation 1[f] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	transmit resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.	
31[pre]	A base station, comprising:	<i>See disclosure at Limitation 1[a] above.</i>
31[a]	means for communicating directly with a first data network;	<i>See disclosure at Limitation 1[a] above.</i>
31[b]	means for wirelessly communicating with each of a plurality of backhaul user equipment (bUE) devices through at least a first communication technology, wherein the plurality of bUE devices are each operable to communicate with a second data network through at least a second communication technology;	<i>See disclosure at Limitation 1[b] above.</i>
31[c]	means for wirelessly communicating with one or more user equipment (UE) devices, and network connect the one or more UE devices to	<i>See disclosure at Limitation 1[c] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	the second data network through one or more of the plurality of bUE devices or to the first data network through a third communication technology;	
31[d]	a controller operative to select one or more of the plurality of bUE devices for backhaul (BH) traffic to the second data network or the BS for BH traffic directly to the first data network, wherein the BH traffic comprises access traffic associated with the one or more UE devices;	<i>See disclosure at Limitations 1[a]-[d] above.</i>
31[e]	the controller operative to aid in selecting a transmission power level of at least one of the plurality of bUE devices, and at least one of the one or more UE devices; and	<i>See disclosure at Limitation 1[e] above.</i>
31[f]	means for transmitting resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and	<i>See disclosure at Limitation 1[f] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	the access traffic of at least one of the one or more UE devices.	
32	The BS of claim 31, wherein the one or more UE devices wirelessly communicate with the BS and the plurality of bUE devices wirelessly communicate with the BS utilizing a same wireless communication technology.	See disclosure at Limitation 31[c] above. See also disclosures cited in Appendix B-C.
33	The BS of claim 31, wherein the controller of the BS is further operative to obtain one or more first parameters associated with the wireless communication between one or more of the plurality of bUE devices and the BS.	See disclosure at Claim 6 above.
34	The BS of claim 33, wherein the selection of the one or more of the plurality of bUE devices for the BH traffic is based on the first parameters.	See disclosure at Claim 33 above.
35	The BS of claim 31, wherein the	See disclosure at Claim 9 above.

'502 Patent Claim	Limitation	Description of the Industry
	controller of the BS is further operative to obtain one or more second parameters associated with the second data network through at least the second communication technology.	
36	The BS of claim 35, wherein the selection of the one or more of the plurality of bUE devices for the BH traffic is based on the one or more second parameters.	<i>See disclosure at Claim 35 above.</i>
37	The BS of claim 31, wherein the access traffic associated with the one or more UE devices is classified into two or more data flows based on a data flow parameter and the selection of the one or more plurality of bUE devices for the BH traffic is based in part on the data flow parameter.	<i>See disclosure at Claim 12 above.</i>
38	The BS of claim 31, wherein the controller of the BS is further operative to classify and prioritize the BH	<i>See disclosure at Claim 17 above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	traffic based on the access traffic, and wherein the RB scheduling information for the BH traffic is based on the BH traffic prioritization.	
39	The BS of claim 31, wherein a bUE selection of one or more of the plurality of bUE devices is based on one or more first parameters of the wireless communication with the BS or one or more second parameters of the second communication technology.	<i>See disclosure at Claims 6 and 9 above.</i>
40[pre]	A backhaul user equipment (bUE) device the bUE device operative to:	<i>See disclosure at Limitation 1[b] above.</i>
40[a]	wirelessly communicate with a base station (BS);	<i>See disclosure at Limitation 1[b] above.</i>
40[b]	communicate a second data network through at least a second communication technology; wherein	<i>See disclosure at Limitation 1[b] above.</i>
40[c]	the bUE device is one of a plurality of bUE devices, wherein each of the bUE devices is also	<i>See disclosure at Limitation 1[b] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	operable to communicate with second data network;	
40[d]	the bUE further operative to: be selected from the plurality of bUE devices for backhaul (BH) traffic to the second data network, wherein the BH traffic comprises access traffic associated with one or more UE devices;	<i>See disclosure at Limitation 1[d] above.</i>
40[e]	[the bUE further operative to:] receive from the BS a signal for aiding in selecting a transmission power level;	<i>See disclosure at Limitation 1[e] above.</i>
40[f]	[the bUE further operative to:] receive from the BS transmit resource block (RB) scheduling information for the BH traffic; wherein	<i>See disclosure at Limitation 1[f] above.</i>
40[g]	the BS wirelessly communicates with the one or more user equipment (UE) devices, and network connects the one or more UE devices to the second data network through one or more of the plurality of bUE devices or to a first data network through a third	<i>See disclosure at Limitation 1[c] above.</i>

'502 Patent Claim	Limitation	Description of the Industry
	communication technology, wherein the first data network is different than the second data network.	
41	The bUE device of claim 40, further operative to process a BH traffic header information based on the second data network through the at least a second communication technology.	A bUE device processing a BH traffic header information based on the second data network through the at least a second communication technology was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-O.
42	The bUE device of claim 40, further operative to send or receive a traffic intended for the bUE, wherein the bUE selects between wirelessly communicating the traffic with the BS or communicating the traffic with the second data network through the at least second communication technology.	A bUE device operative to send or receive a traffic intended for the bUE, wherein the bUE selects between wirelessly communicating the traffic with the BS or communicating the traffic with the second data network through the at least second communication technology was well known. <i>See, e.g.,</i> Disclosures cited in Appendix B-P.
43[pre]	A method of providing backhaul, comprising:	<i>See</i> disclosure at Limitations 1[a]-[d] above.
43[a]	wirelessly communicating, by at least one of a plurality of backhaul user equipment	<i>See</i> disclosure at Limitations 1[a] and [b] above.

'502 Patent Claim	Limitation	Description of the Industry
	(bUE) devices, with a base station (BS) through at least a first communication technology;	
43[b]	communicating, by at least one of the plurality of bUE devices, with a second data network through at least a second communication technology;	See disclosure at Limitation 1[b] above.
43[c]	wirelessly communicating, by the BS, with one or more user equipment (UE) devices, and network connecting the one or more UE devices to the a second data network through one or more of the plurality of bUE devices or to a first data network through a third communication technology, wherein the second data network is different than the first data network;	See disclosure at Limitations 1[b] and [c] above.
43[d]	selecting, one or more of the plurality of bUE devices for backhaul (BH) traffic to the second data network or the BS for BH traffic to the first data network, wherein the	See disclosure at Limitation 1[d] above.

'502 Patent Claim	Limitation	Description of the Industry
	BH traffic comprises access traffic associated with the one or more UE devices;	
43[e]	aiding, by the BS, in selecting a transmission power level of at least one of the plurality of bUE devices, or at least one of the one or more UE devices; and	See disclosure at Limitation 1[e] above.
43[f]	transmitting, by the BS, resource block (RB) scheduling information for the BH traffic of at least one of the plurality of bUE devices and the access traffic of at least one of the one or more UE devices.	See disclosure at Limitation 1[f] above.
44	The method of claim 43, further comprising obtaining one or more first parameters associated with the wireless communication between one or more of the plurality of bUE devices and the BS.	See disclosure at Claim 6 above.
45	The method of claim 44, wherein the selection of the one or more of the	See disclosure at Claim 44 above.

'502 Patent Claim	Limitation	Description of the Industry
	plurality of bUE devices for the BH traffic is based on the first parameters.	
46	The method of claim 43, wherein a bUE selection of one or more of the plurality of bUE devices is based on one or more first parameters of the wireless communication with the BS or one or more second parameters of the second communication technology.	<i>See disclosure at Claims 6 and 9 above.</i>

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/s/ Jacob K. Baron

Jacob K. Baron, Esq.
MA Bar No.: 652568
Email: jacob.baron@hklaw.com
Joshua C. Krumholz, Esq.
(LEAD COUNSEL)
(*Pro hac vice*)
MA Bar No.: 552573
Email: joshua.krumholz@hklaw.com
Jacob W. S. Schneider, Esq.
(*Pro hac vice*)
MA Bar No.: 675315
Email: jacob.schneider@hklaw.com
Allison M. Lucier, Esq.
(*Pro hac vice*)
MA Bar No.: 569193
Email: allison.lucier@hklaw.com
HOLLAND & KNIGHT LLP
10 Saint James Avenue; 11th Floor
Boston, MA 02116
Telephone: 617-523-2700
Facsimile: 617-523-6850

Deron R. Dacus
Texas Bar No. 00790553
E-mail: ddacus@dacusfirm.com
THE DACUS FIRM, P.C.
821 ESE Loop 323, Suite 430
Tyler, Texas 75701
903-705-1117 (phone)
903-581-2543 (fax)

*Attorneys for Defendants T-Mobile USA, Inc.,
Sprint LLC, AT&T Services, Inc., AT&T
Mobility, LLC, AT&T Corp., Cellco
Partnership, d/b/a Verizon Wireless, and
Verizon Corporate Services Group Inc.*

Respectfully submitted,

Nicholas Mathews
Texas State Bar No. 24085457
nmathews@McKoolSmith.com
Texas State Bar No. 24078867
Erik Fountain
efountain@McKoolSmith.com
Texas State Bar No. 24097701
MCKOOL SMITH, P.C.
300 Crescent Court Suite 1500
Dallas, TX 75201
Telephone: (214) 978-4000
Telecopier: (214) 978-4044

*Attorneys for Defendants AT&T Services, Inc.,
AT&T Mobility LLC and AT&T Corp.*

Melissa R. Smith
melissa@gillamsmithlaw.com
GILLIAM & SMITH, LLP
303 South Washington Avenue
Marshall, TX 75670
Telephone: (903) 934-8450
Facsimile: (903) 934-9257

*Attorney for Defendants T-Mobile USA, Inc.
and Sprint LLC*

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing document entitled **DEFENDANTS' INITIAL INVALIDITY CONTENTIONS** was served electronically on this 20th day of May, 2024 via email upon Headwater's counsel of record, listed below.

/s/ Jacob K. Baron
Jacob K. Baron

Headwater Partners II LLC's Counsel of Record:

Adam S Hoffman
Email: ahoffman@raklaw.com
Amy Elizabeth Hayden
Email: ahayden@raklaw.com
Benjamin T Wang
Email: bwang@raklaw.com
Brian D Ledahl
Email: bledahl@raklaw.com
Dale Chang
Email: dchang@raklaw.com
James A Milkey
Email: jmilkey@raklaw.com
James N Pickens
Email: james@jamespickenslaw.com
James Shrin Tsuei
Email: jtsuei@raklaw.com
Jason Wietholter
Email: jwietholter@raklaw.com
Kristopher Ryan Davis
Email: kdavis@raklaw.com
Neil Alan Rubin
Email: nrubin@raklaw.com
Paul Anthony Kroeger
Email: pkroeger@raklaw.com
Philip X Wang
Email: pwang@raklaw.com
Qi Tong
Email: ptong@raklaw.com
Reza Mirzaie
Email: rmirzaie@raklaw.com
Marc A Fenster
Email: mafenster@raklaw.com
RUSS AUGUST & KABAT

12424 Wilshire Boulevard, 12th
Floor
Los Angeles, CA 90025
Phone: 310/826-7474

Charles Ainsworth
Email: charley@pbatyler.com
Robert Christopher Bunt
Email: rcbunt@pbatyler.com

PARKER BUNT & AINSWORTH

100 E Ferguson, Suite 418
Tyler, TX 75702
Phone: 903/531-3535

*Attorneys for Plaintiff Headwater
Partners II LLC*