

General Information Request Regarding the AT&T/Qualcomm Transaction
Questions for AT&T
WT Docket No. 11-18
May 20, 2011

1. Provide an organization chart and personnel directory in effect since January 1, 2009, for AT&T as a whole and for each of AT&T's facilities or divisions involved in any activity relating to any relevant product or relevant service.
2. Provide a list, in Excel or other machine readable format as of the date of this Request, organized by state (including the District of Columbia, and Puerto Rico), and then by county (or municipality in the case of Puerto Rico), of each spectrum license that can be used in the provision of mobile wireless services that AT&T: (a) holds; (b) manages; (c) contracted to acquire; (d) is in negotiations to acquire; (e) plans to transfer or assign; (f) has an interest in; (g) has a joint venture or other business arrangement; or (h) leases to or from another person or entity. For each license, identify the (a) FIPS Code; (b) county (and the District of Columbia and each municipality in the case of Puerto Rico); (c) state; (d) market name, (e) market number, (e.g. CMA, MTA, and/or BTA), (f) spectrum type, (g) spectrum block (h) amount of spectrum, (i) the wireless technology format (e.g. GSM, EDGE, UMTS, HSPA, HSPA+, LTE) deployed at present and any future plans; (j) any measures of past/present/expected spectrum utilization (k) whether AT&T: (i) holds; (iii) manages; (iv) contracted to acquire; (v) is in negotiations to acquire; (vi) plans to transfer or assign; (vii) has an interest in; (viii) has a joint venture or other business arrangement; or (ix) leases to or from another person or entity.
3. On page 13 of the Public Interest Statement, the Applicants state that "AT&T plans to begin LTE deployment in the middle of this year over its 700 MHz and AWS spectrum, which it expects largely to complete by the end of 2013."
 - i. For all CMAs, discuss in detail (on a CMA by CMA basis) these baseline AT&T plans, capacity needs, and timeframe for deploying an LTE network, marketing any relevant services and products, and making changes to any service and pricing plans (with the corresponding pricing assumptions) (*i.e.*, absent both the Proposed Transaction and the proposed AT&T/Deutsche Telekom-T-Mobile merger). Discuss, in detail, how and to what extent the Proposed Transaction would affect these plans, capacity needs, and timeframes, separately assuming that the proposed AT&T/Deutsche Telekom-T-Mobile merger has been approved and assuming that the proposed AT&T/Deutsche Telekom-T-Mobile merger has not been approved. Provide all strategic plans, policies, analyses, reports and presentations prepared on or after January 1, 2007, discussing these issues.
 - ii. For all CMAs, describe in detail (on a CMA-by-CMA basis) the current and projected uplink and downlink data usage by your current and projected customer base, and the corresponding pricing assumptions, technologies and services currently used or projected to be used through 2014. Provide projections for the baseline case (*i.e.*, absent both the Proposed Transaction and the proposed AT&T/Deutsche Telekom-T-Mobile merger), as well as two separate projections showing the impact of the Proposed Transaction: (a) for circumstances as set forth in the Proposed Transaction (*i.e.*, absent any AT&T/Deutsche

Telekom-T-Mobile merger), and (b) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.

4. For all CMAs, discuss (on a CMA-by-CMA basis) AT&T's current and projected capacity and bandwidth requirements for mobile wireless services, corresponding covered population, and corresponding pricing assumptions. Include the amount and type of spectrum required by AT&T to provide current and projected relevant services and services that would use the LTE network for AT&T's retail subscribers. Explain precisely why AT&T believes it is capacity constrained, including how and where such asserted capacity constraints affect AT&T's current and projected ability to provide mobile wireless services to its customers, with any relevant pricing assumptions. Provide current and projected information for the baseline case (*i.e.*, absent both the Proposed Transaction and the proposed AT&T/Deutsche Telekom-T-Mobile merger), as well as separate projections showing the impact of the Proposed Transaction: (a) for circumstances as set forth in the Proposed Transaction (*i.e.*, absent any AT&T/Deutsche Telekom-T-Mobile merger), and (b) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.
5. Explain (a) types of mobile wireless services and applications that would benefit from use of a supplemental downlink; (b) how the use of supplemental downlink technology can provide efficiencies in the provision of those mobile wireless services; and (c) any projected efficiencies that a supplemental downlink technology, when combined with technology on paired spectrum, can bring in the provision of mobile wireless services. Provide all strategic plans, policies, analyses, reports and presentations discussing these issues.
6. On page 17 of the Public Interest Statement, the Applicants state that "the Qualcomm Spectrum substantially will boost the capacity that otherwise would have been available." Quantify how the acquisition of the spectrum assets will substantially boost capacity, including the number of customers affected, speed of uplink and downlink, and service quality: (a) for circumstances as set forth in the Proposed Transaction (*i.e.*, absent any AT&T/Deutsche Telekom-T-Mobile merger), and (b) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.
7. Provide all strategic plans, policies, analyses, reports and presentations, from January 1, 2007 to the present, discussing possible constraints in capacity or in increasing capacity to serve current and potential future customers, including:
 - i. Acquisition of new spectrum;
 - ii. Plans to increase network capacity using existing spectrum;
 - iii. Alternative solutions to spectrum constraint problems;
 - iv. Repurposing spectrum; and
 - v. Constraints other than spectrum (*e.g.*, backhaul).
8. On page 14 of the Public Interest Statement, the Applicants state that the Qualcomm spectrum would enable AT&T to add "substantial capacity on its LTE network," and "provide a more robust and competitive service." Explain in detail and provide all documents that discuss why the expanded capacity made possible by the supplemental downlink technology would be needed for AT&T to provide a more robust and competitive service. The information in

response to this question should be provided separately for the following circumstances: (a) for circumstances as set forth in the Proposed Transaction (*i.e.*, absent any AT&T/Deutsche Telekom-T-Mobile merger), and (b) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.

9. On pages 6-7 of the Rinne Declaration, it states that “[t]he addition of the Qualcomm Spectrum to the LTE network will result in trunking efficiency gains and higher downlink peak speeds, a significant increase in throughput, and lower latencies in the network.” Provide all strategic plans, policies, analyses, reports, and presentations, including any feasibility studies, that discuss trunking as well as other efficiency gains, higher downlink peak speeds, increased throughput, and lower latencies that may result from this supplemental downlink capacity for different user applications. Provide as well detailed estimates of the magnitude of increases in all efficiencies, including spectrum efficiency, that may result from the use of Qualcomm’s spectrum to provide AT&T with supplemental downlink capacity.
10. On page 15 of the Public Interest Statement, the Applicants state that “AT&T and likely other carriers will make significant use of supplemental downlink technology as they strive to meet consumers’ seemingly ever-growing appetite for wireless broadband services.” In support of this assertion, on pages 2-3 of her Declaration, Dr. Rinne notes an expectation that AT&T and other providers in the United States and around the world, will turn to supplemental downlink “as they attempt to efficiently manage their spectrum to help meet consumers’ increasing demand for wireless broadband services.” Explain in detail the basis for these statements. Identify the other U.S providers and define “wireless broadband services” as used by Dr. Rinne in this context. Provide all documents discussing this issue, including documents that discuss Dr. Rinne’s expectation that other providers in the U.S. and around the world will use supplemental downlink technology.
11. Page 4 of the Rinne Declaration states, “The Qualcomm Spectrum will enable AT&T to expand capacity on its LTE network nationwide. AT&T will acquire the Lower 700 MHz D and E Blocks in major metropolitan areas – New York, Boston, Philadelphia, Los Angeles and San Francisco AT&T will be able to expand the LTE downlink capacity in such areas by as much as an additional 10 MHz, with the remaining 2 MHz available as guard band.” On page 5, the Rinne Declaration further states, “[i]n areas where Qualcomm holds only Lower 700 MHz D Block spectrum, AT&T will use up to 5 MHz of the spectrum to expand its LTE downlink capacity, with the remaining 1 MHz available as a guard band. Explain these statements in detail and provide all documents discussing this issue. As part of the response, address the following:
 - i. How AT&T plans to mitigate base station-to-base station interference from downlink Lower 700 MHz D or D and E Block transmissions to its own uplink transmissions in the Lower 700 MHz B and/or C Blocks. Address separately situations in which AT&T would hold only the D Block license and situations in which AT&T would hold both D and E Block licenses. Describe the following:
 - a. The extent to which AT&T’s B and C Block base stations and D and E Block base stations will be operating on different towers/buildings in the same geographic area or co-located at the same towers/buildings.
 - b. For i.a above, calculations of the amount of isolation (in decibels - dB) required between base stations or other network equipment transmitting on the D or D and E Blocks and AT&T base stations or other network equipment receiving on the B

- and/or C Blocks. These calculations should include analyses of interference from out-of-band emissions, in-band blocking, and intermodulation, as well as a determination of the dominant interference mechanism, along with any other relevant data.
- c. Deployment practices that will achieve the required isolation, including required vertical, horizontal, and angular separation of antennas and other network equipment, filter performance on the B and C Blocks receive channels (at the base stations and other network equipment), level of reduction of out-of-band emissions from transmissions in the Lower 700 MHz D or D and E Blocks, and any other factors that may contribute to the required isolation.
 - d. Any associated performance degradation, limitations, affects on capacity and/or additional costs related to the above solutions.
- ii. How AT&T's deployment of Lower 700 MHz D Block or D and E Block base stations will affect base station deployments by other licensees in the Lower 700 MHz A, B, and C Blocks. Describe the following:
- a. The extent to which deployments by other licensees in the A, B, or C Blocks will need to be co-located on the same towers/buildings with, or on locations in the vicinity of, AT&T's Lower 700 MHz D or D and E Block base stations. Include descriptions of (1) how AT&T's deployment in the D or D and E Blocks will affect future deployments in the A, B, or C Blocks by other licensees, and (2) how existing deployments by other licensees will affect AT&T's deployment in the D or D and E Blocks. Describe in detail how AT&T will coordinate its D or E Block base station deployment with other Lower 700 MHz licensees in both of these cases, and describe any assumptions that AT&T is making about the technology, topology, or other characteristics of these deployments.
 - b. Any differences between the required base station isolation, or methodology to achieve it, as described in i.b and i.c above when considering interference to other Lower 700 MHz licensees.
 - c. Any associated performance degradation, limitations, affects on capacity, and/or additional costs related to the above solutions.
- iii. How AT&T plans to mitigate and/or otherwise address the possibility of mobile-to-mobile interference to user devices utilizing the Lower 700 MHz D or D and E Block transmissions on the Lower 700 MHz A, B, and C Blocks Describe the following:
- a. The minimum required isolation (in dBs) and corresponding separation distance between mobile devices receiving on the Lower 700 MHz D or D and E Block and those transmitting on the A, B, or C Blocks to ensure interference-free reception of supplemental downlink transmissions.
 - b. Any differences between how AT&T might mitigate the effects of interference caused by their own Band 17 devices versus that caused by Band 12 or Band 17 devices developed and deployed by other Lower 700 MHz licensees.

- c. Any effects on cost and any possible limitations (*e.g.*, capacity, performance, commercial availability, etc.) on Lower 70 MHz user devices, including those operating in the Lower 700 MHz D or D and E Blocks, as well as those operating in Band 12 or Band 17.
12. Explain and provide all documents discussing the effect of the Proposed Transaction on interoperability of devices within the 700 MHz band and across other bands, including AWS, cellular, PCS, and Lower 700 MHz B and C Block spectrum. What combinations of spectrum bands do the Applicants anticipate being included in the design of mobile devices going forward, in light of or absent the Proposed Transaction?
13. On page i of the Public Interest Statement, the Applicants state that AT&T “plans to promptly bond the Qualcomm Spectrum with paired spectrum in its LTE network as soon as the standards and equipment utilizing innovative supplemental downlink technology are available, which AT&T expects to occur by 2014.” Further, page 3 of the Rinne Declaration estimates that “AT&T would be able to deploy handsets and equipment incorporating the Qualcomm Spectrum as early as 2014.”
 - i. Discuss in detail how the standards and equipment referenced in the statements above will be developed through 2014. In particular, identify each stage of the process for developing standards for this equipment, manufacturing this equipment, testing this equipment and making it available for commercial use.
 - ii. Provide specific status and official target dates developed by the 3GPP and other standards organization on the completion of related standards to achieve spectrum aggregation and the frequency band specifications for LTE using the 700 MHz and AWS bands as well as other spectrum scenarios mentioned in the Public Interest Statement and the declarations.
14. With reference to page 7 of the Public Interest Statement, regarding AT&T’s plans to promote “full and efficient utilization of the Qualcomm Spectrum,” discuss in detail how this transaction would affect AT&T’s service offerings and coverage and capacity in rural as well as urban and suburban areas for both mobile and fixed users. Provide the definition of “urban,” “suburban,” and “rural” used in answering this question.
15. On pages ii and iii of the Joint Opposition, the Applicants state that “this transaction will stimulate competition, foster innovation, and advance the country’s position globally by providing AT&T additional spectrum capacity to compete with other carriers rolling out LTE mobile broadband services.” Explain this statement in detail, by providing all documents discussing this issue and by providing specifics as to how this transaction will stimulate competition among competing providers, foster innovation, and advance the interests of the United States globally, as compared with the circumstances absent the Proposed Transaction. Explain separately any incremental impact of the Proposed Transaction assuming that the proposed AT&T/Deutsche Telekom-T-Mobile merger has been approved. Provide all documents discussing these issues.
16. On page 6 of the Public Interest Statement, the Applicants state that “the market has shown that the Lower 700 MHz D and E blocks cannot and will not be put to full and efficient use as stand-alone one-way 6 MHz licenses.” On page 7 of the Public Interest Statement, the Applicants state that “there is a risk that the unpaired Lower 700 MHz D and E blocks will remain under-utilized unless they can be used in conjunction with other paired spectrum to enhance

broadband capacity.” Provide all documents discussing how to make use of this spectrum and efforts by standard-setting organizations and equipment manufacturers to facilitate use, including documents discussing the efforts of existing licensees of the Lower 700 MHz Band, including D and E block licensees.

17. On page 30 of the Public Interest Statement, the Applicants assert that the market for wireless services is “robustly competitive, and that this transaction will not change that,” and that there is “no shortage of competition in advanced mobile broadband services.” In particular, with regard to spectrum holdings, the Applicants state on pages 30-33 that T-Mobile as well as the other two nationwide providers – have “sufficient spectrum to roll out 4G service.” The Applicants also assert on page 31 that T-Mobile “holds 50.4 MHz of spectrum on a nationwide average basis, which is proportionately more than AT&T given that T-Mobile supports a consumer base slightly more than one third of the size of AT&T’s.” The Applicants note as well on page 33 that T-Mobile “has announced plans to double the speed of its 4G network in order to bring speeds of up to 42 Mbps to 140 million people by the end of the year.” In light of those assertions:
- i. Explain, and provide all documents discussing how much spectrum is necessary to roll out competitive 4G services. Provide the definition of “4G” used in answering this question.
 - ii. Explain, and provide all documents discussing whether some or all of the three other nationwide providers have the spectrum necessary to roll out competitive 4G services and networks in the timeframe specified in the Public Interest Statement. Provide the definition of “4G” used in answering this question.
 - iii. Provide all documents discussing the competitive significance of each provider mentioned in your Public Interest Statement, on a provider-by-provider basis.

This information should be provided separately (a) for the baseline case (*i.e.*, absent both the Proposed Transaction and the proposed AT&T/Deutsche Telekom-T-Mobile merger), (b) for circumstances as set forth in the Proposed Transaction (*i.e.*, absent any AT&T/Deutsche Telekom-T-Mobile merger), and (c) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.

18. On pages 34-35 of the Public Interest Statement, the Applicants state that MetroPCS has already launched 4G LTE service in certain metropolitan areas, and that LightSquared is expected to begin rollout of LTE services beginning later this year. On page 35 of the Public Interest Statement, the Applicants state that “other regional providers have sufficient spectrum to provide mobile broadband services,” and pages 35-38 specifically mention Cricket (a subsidiary of Leap Wireless), U.S. Cellular, nTelos, Allied Wireless Communications, Cellular South, and Cox. With respect to those assertions, discuss in detail, with respect to each of these providers, how the provider would have sufficient spectrum to compete with AT&T in the provision of these mobile wireless services. This information should be provided separately (a) for circumstances as set forth in the Proposed Transaction (*i.e.*, absent any AT&T/Deutsche Telekom-T-Mobile merger); and (b) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.
19. Page 4 of the Reed and Tripathi Declaration states that “[n]or does it follow that a higher-frequency network operator would necessarily have materially higher costs even if more base

stations were required to obtain equivalent coverage. While the number of base stations deployed is certainly one important driver of wireless costs, there are many others.”

- i. Describe in detail circumstances in which the many other costs would result in a network operator not having higher costs from use of higher-frequency spectrum.
 - ii. Provide underlying link budget assumptions for both the uplink and downlink for bands used or planned to be used by AT&T that are above and below 1 GHz (*e.g.*, PCS, AWS, WCS, 850 MHz and 700 MHz) including (but not limited to):
 - a. Assumed transmit power and all gains and losses;
 - b. Assumed performance requirements (bit rate) for mobile and pedestrian applications, including corresponding signal to noise ratio requirements;
 - c. Indoor penetration losses and other assumptions that may be specific to urban, suburban and rural deployments; and
 - d. Fade and other assumed margins.
20. Provide all documents, data and analysis cited in the Public Interest Statement and the declarations of David Wise, Kristin S. Rinne, Professor Jeffrey H. Reed and Dr. Nishith D. Tripathi, and all documents and data relied upon in preparing those documents, grouped by declaration/Public Interest Statement as stated in Instruction number 6. To the extent the information has already been provided, specify the response to which it was also submitted.
21. Provide all documents discussing AT&T’s valuation(s) of Qualcomm’s spectrum assets. Include any valuations of Qualcomm’s spectrum assets in the absence of the proposed AT&T/Deutsche Telekom-T-Mobile merger, as well as any valuations assuming that proposed merger has been approved. Provide all documents discussing the cost and relative valuation of any spectrum license the AT&T considered acquiring or acquired in the secondary market.
22. Provide all strategic plans, policies, analyses, reports and presentations discussing the Qualcomm spectrum and its expected use.
23. Provide all documents discussing presentations to management committees, executive committees, boards of directors, investors, investor analysts, and industry analysts regarding the effect of the Proposed Transaction, including the effect on AT&T’s spectrum constraints and business plans, (a) for circumstances as set forth in the Proposed Transaction (*i.e.*, absent any AT&T/Deutsche Telekom-T-Mobile merger), and (b) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.
24. Provide all strategic plans, policies, analyses, reports and presentations discussing how AT&T evaluates and monitors capacity, including the amount of spectrum, speed of connection, and facilities (including, cell site configuration and backhaul) that are required to meet consumer demand.
25. Provide all strategic plans, policies, analyses, reports and presentations discussing AT&T network traffic – including network traffic statistics and current and projected data on traffic loads in both the uplink and downlink directions – for your current and projected customer base,

and the corresponding technologies and services currently used or projected to be used through 2014.

26. Provide copies of the following AT&T documents that were provided to the Department of Justice:
- i. Proposed Solution for the Low 700 MHz Band (dated August 13, 2010);
 - ii. Spectrum Band Plan Strategy, Spectrum Steering Committee (dated August 30, 2010);
 - iii. Playbook for Wireless Network Quality Impact (not dated): Bates number AT&T00001;
 - iv. Spectrum Acquisition Estimates (not dated): Bates number AT&T00037;
 - v. AT&T Inc. Acquisition of 700MHz Spectrum from Qualcomm Inc. (Arnold & Porter dated Jan 14, 2011);
 - vi. December 2010 Spectrum Activity Summary (not dated): Bates number AT&T000207-216 ;
 - vii. Wireless Evolution: Supply/Demand Analysis: Bates number AT&T00140-00173 (March 8, 2010);
 - viii. LTE 250M Pops by 2013- LTE "Largely Complete by 2013" Plan 8k/16k/20k=44k nodes - RAN fundamental Planning: Bates number AT&T00174-00206 (January 11, 2011);
 - ix. Spectrum Acquisition Estimates: Bates number AT&T00037-00054 (August 3, 2010); and
 - x. Tabular Data (including data on number of base stations, number of subscribers, and spectrum and demand requirements): Bates number AT&T00055-000139.

Definitions

1. The term “AT&T” means AT&T Inc., its parents, predecessors, divisions, subsidiaries, affiliates, partnerships and joint ventures, and all directors, officers, employees, agents, and representatives of the foregoing. The terms “parent”, “subsidiary,” “affiliate,” and “joint venture” refer to any person in which there is partial (10 percent or more) or total ownership or control between the company and any other person.
2. The term “Qualcomm” means Qualcomm Incorporated, its parents, predecessors, divisions, subsidiaries, affiliates, partnerships and joint ventures, and all directors, officers, employees, agents, and representatives of the foregoing. The terms “parent”, “subsidiary,” “affiliate,” and “joint venture” refer to any person in which there is partial (10 percent or more) or total ownership or control between the company and any other person..
3. The term “Applicants” means AT&T Inc. and Qualcomm Incorporated, collectively.
4. The term “Application” means the application, File No. 0004566825, to which Exhibit 1 –Public Interest Statement is attached.
5. The terms “and” and “or” have both conjunctive and disjunctive meanings.
6. The word “any” shall be construed to include the word “all,” and the word “all” shall be construed to include the word “any.” The word “each” shall be construed to include the word “every,” and the word “every” shall be construed to include the word “each.” All words used in the singular should be construed to include the plural, and all words used in the plural should be construed to include the singular.
7. The term “AT&T/Deutsche-Telekom-T-Mobile merger” means the proposed acquisition of T-Mobile USA, Inc. by AT&T filed on April 21, 2011, with lead application file number for the wireless radio services listed as 0004669383.
8. The term “CDMA” means Code Division Multiple Access technology.
9. The term “CMA” means Cellular Market Area.
10. The term “discussing” when used to refer to documents means analyzing, constituting, summarizing, reporting on, considering, recommending, setting forth, or describing a subject. Documents that contain reports, studies, forecasts, analyses, plans, proposals, evaluations, recommendations, directives, procedures, policies, or guidelines regarding a subject should be treated as documents that discuss the subject. However, documents that merely mention or refer to a subject without further elaboration should not be treated as documents that discuss that subject.
11. The term “documents” means all computer files and written, recorded, and graphic materials of every kind in the possession, custody, or control of the Company. The term “documents” includes without limitation drafts of documents, copies of documents that are not identical duplicates of the originals, and copies of documents the originals of which are not in the possession, custody, or control of the Company. The term “documents” includes, without limitation, materials of every kind in the possession, custody, or control of the Company whether created internally or externally. In addition, the term “documents” includes without limitation any amendments, side letters, appendices, or attachments. The term “computer files” includes without limitation information

stored in, or accessible through, computer or other information retrieval systems. Thus, the Company should produce documents that exist in machine-readable form, including documents stored in personal computers, portable computers, workstations, minicomputers, mainframes, servers, backup disks and tapes and archive disks and tapes, and other forms of offline storage, whether on or off the Company's premises. Electronic mail messages should also be provided, even if only available on backup or archive tapes or disks. Computer files shall be printed and produced in hard copy or produced in machine-readable form (provided that Commission staff determine prior to submission that it would be in a format that allows the Commission to use the computer files), together with instruction and all other materials necessary to use or interpret the data. Unless otherwise specified, the term "documents" excludes bills of lading, invoices, purchase orders, customs declarations, and other similar documents of a purely transactional nature and also excludes architectural plans and engineering blueprints. Where more than one identical copy of a requested document exists, the Company shall only submit one representative copy.

12. The term "EDGE" means Enhanced Data rates for GSM Evolution technology.
13. The term "GSM" means Global System for Mobile Communications technology.
14. The term "HSPA" or "HSPA+" means High Speed Packet Access or High Speed Packet Access + technology.
15. The term "identify," when used with reference to a Person or Persons, means to state his/her full legal name, current or last known business address, current or last known telephone number, current or last known organization, and position therewith. "Identify," when used with reference to a document, means to state the date, author, addressee, type of document (e.g., the types of document, as described above), a brief description of the subject matter, its present or last known location, and its custodian, who must also be identified. "Identify," when used with reference to an entity other than a Person, means to state its name, current or last known business address, and current or last known business telephone number.
16. The term "including" shall be construed as including, but not limited to, and indicates examples for the Applicants to address. The term should not be construed as to limit the response to only those examples listed.
17. The term "LTE" means Long Term Evolution technology.
18. The term "mobile wireless application," also referred to as "application software" or "app," means a computer system that enables one or more function on a mobile wireless device running a mobile operating system (e.g., Android, iOS).
19. The term "mobile wireless data services" means any data communications service using radio transmission between mobile or fixed stations and a network providing communication of packet data information, including but not limited to, broadband data, video, remote file access, status reporting, facsimile, and internet/intranet access. Mobile wireless data services include non interconnected Voice over IP but exclude mobile wireless voice and text services, as defined herein.
20. The term "mobile wireless services" includes mobile wireless voice services, mobile wireless text services, mobile wireless data services, and mobile wireless applications.
21. The term "mobile wireless text services" means any communications service using radio transmission between mobile or fixed stations and a network providing communication of numeric

or alphanumeric messages, such as multi media messaging, short messaging, and short codes. Mobile wireless text services exclude e-mails.

22. The term “mobile wireless voice services” means interconnected voice communications services provided using radio transmission between mobile or fixed stations on a wireless basis to customers, other than fixed wireless services. Mobile wireless voice services include interconnected Voice over IP.
23. The term “MSAs” means Metropolitan Statistical Areas.
24. The term “Person” includes the Company, and means any individual, partnership, corporation (including a business trust), joint stock company, trust, unincorporated association, joint venture, limited liability company or other entity, or a government or any political subdivision or agency thereof.
25. The term “plans” means tentative and preliminary proposals, recommendations, or considerations, whether or not finalized or authorized, as well as those that have been adopted.
26. The term "POPs" means total aggregate population.
27. The term “Proposed Transaction” means the proposed assignment of licenses held by Qualcomm to AT&T filed on January 13, 2011 with file number for the wireless radio services listed as 0004566825.
28. The term “Public Interest Statement” refers to the document filed by the Applicants on January 13, 2011 entitled “Description of Transaction, Public Interest Showing, and Related Demonstrations.”
29. The term “Reed and Tripathi Declaration” refers to the Joint Declaration of Professor Jeffrey H. Reed and Dr. Nishith Tripathi filed as an exhibit to the Applicants’ Joint Opposition filed on March 21, 2011.
30. The term "relevant product" means (and information should be provided separately for, any of the mobile wireless services and using any of the following formats: GSM, EDGE, UMTS only, HSPA, HSPA+, and LTE):
 - a. feature mobile devices: wireless handset devices that are cable of supporting voice services as well as text services;
 - b. smartphones: wireless handset devices other than iPhones, with advanced computing capability and connectivity sufficient to run complete mobile operating system software (e.g., Android, Research in Motion Ltd. Blackberry, Windows phone) to support all mobile wireless services, including broadband data and video applications as well as voice, photographic cinematic, and audio-visual media player services (including books, periodicals, movies, music, games);
 - c. iPhones: smartphones designed and marketed by Apple Inc.,;
 - d. tablet PCs (includes netbook PCs): portable devices (other than iPads) with touch screen and/or a QWERTY keyboard input, and advanced computing capability and connectivity sufficient to run complete operating system software (e.g., Android, Windows) to support broadband data and video applications as well as photographic, cinematic, and audio-visual media player services (including books, periodicals, movies, music, games);
 - e. iPads: tablet PCs designed by Apple Inc.,;

- f. e-readers: portable personal computing devices with a display size of 6" to 10" typically, with advanced computing capability and connectivity sufficient to enable users to shop for, purchase, download, and display text, designed primarily for the purpose of reading books, newspapers, and periodicals;
 - g. "air cards" (also referred to as "laptop cards"): portable wireless modems that enable personal computing devices to connect to a mobile wireless network in order to support and deliver voice, data, and video services;
 - h. mobile hotspots devices: network routing devices that enable portable, Wi-Fi enabled handset and personal computing devices to connect to a mobile wireless network in order to support and deliver voice, data, and video services; and
 - i. other mobile wireless devices not listed above. Describe the other devices included in this category.
31. The term "relevant service" as used herein means (and information shall be provided separately for, any of the services identified below and using any of the following formats: GSM, EDGE, UMTS only, HSPA, HSPA+, and LTE):
- a. mobile wireless voice services;
 - b. mobile wireless text services;
 - c. mobile wireless data services; and
 - d. mobile wireless applications
32. The term "Rinne Declaration" refers to the Declaration of Kristin S. Rinne, Senior Vice President – Architecture and Planning, AT&T Services, Inc.
33. The term "RSAs" means Rural Service Areas.
34. The term "Spectrum Assets" means the six D block and five E block licenses in the Lower 700 MHz band subject to the instant transaction.
35. The term "T-Mobile" or "T-Mobile USA, Inc." means Deutsche Telekom AG, its domestic and foreign parents, predecessors, divisions, subsidiaries, affiliates, partnerships, and joint ventures, and all directors, officers, employees, agents, and representatives of the foregoing. The terms "parents", "subsidiary," "affiliate," and "joint venture" refer to any person in which there is partial (10 percent or more) or total ownership or control between Deutsche Telekom and any other person.
36. The term "UMTS" means Universal Mobile Telecommunications System technology.
37. "United States" or "U.S." means the United States, its possessions, territories, and outlying areas.
38. The term "Wise Declaration" refers to the Declaration of David Wise, Senior Vice President, Finance and Strategy of Qualcomm, Incorporated.

Instructions

1. Unless otherwise specified, all Information and Document Requests cover the period from January 1, 2009 through the present.
2. Corporations and other entities, including affiliated or subsidiary entities, shall be identified by the Central Index Key (“CIK”) assigned by the Securities and Exchange Commission (“SEC”). A unique identifier should be used for each entity that has not been assigned a CIK by the SEC.
3. Submit responses to Information Requests in both paper and electronic form, unless an electronic form is specified (*e.g.*, electronic spreadsheet). Submit responses to Document Requests (including materials containing Highly Confidential or Confidential Information) in electronic form only in a manner that is fully compatible with the Commission’s Summation Enterprise software database, as set forth in the Instructions for Submission of Electronic Documents. The Commission does not require the submission of paper copies of these documents at this time, but reserves the right to require their submission at a later time.
4. Each requested document shall be submitted in its entirety, even if only a portion of that document is responsive to a request made herein. This means that the document shall not be edited, cut, or expunged, and shall include all appendices, tables, or other attachments, and all other documents referred to in the document or attachments. All written materials necessary to understand any document responsive to these requests shall also be submitted.
5. Unless otherwise specified, provide data and interrogatory responses separately for prepaid, post-paid, wholesale, and all mobile wireless services.
6. For each document or statement submitted in response to the requests, indicate, by number, the request to which it is responsive and, for documents, identify the Person(s) from whose files the document was retrieved (*i.e.*, custodian). Group submitted materials according to the request number to which they are responsive and then, within each of those request-number groupings, by the appropriate custodian. If a document is responsive to more than one request, submit the document in response to the first request to which it is responsive, and, in accordance with instruction 7 below, indicate in the metadata accompanying the document’s electronic record all subsequent requests to which it also is responsive. If any document is not dated, if known, state the date on which it was prepared. If any document does not identify its author(s) or recipient(s), provide, if known, the name(s) of the author(s) or recipient(s) as metadata in accordance with Instructions for Submission of Electronic Documents. The Company must identify with reasonable specificity all documents provided in response to these requests. Where more than one identical copy of a requested document exists, the Company may submit only one representative copy, but in all cases all metadata, including without limitation all custodians who possessed identical documents withheld, must be provided in accordance with the provisions of Instructions for Submission of Electronic Documents.
7. The specific requests made herein are continuing in nature. The Company is required to produce in the future any and all documents and information that are responsive to the requests made herein but not initially produced at the time, date, and place specified herein. In this regard, the Company must supplement its responses (a) if the Company learns that, in some material respect, the documents and information initially disclosed were incomplete or incorrect or (b) if additional responsive documents or information are acquired by or become known to the Company after the initial production.

8. Any documents that are withheld in whole or in part from production based on a claim of privilege shall be assigned document control numbers (with unique consecutive numbers for each page of each document). For any page of any Document that the Company has designated to be withheld as entirely privileged, the Company shall submit a substitute, placeholder page that lists only the Document ID of the page that was withheld in entirety as privileged and a statement indicating that the page has been withheld in entirety as privileged. For any document withheld as entirely privilege, it is sufficient to supply one substitute, placeholder page for that document, so long as the range of Document IDs for the entire document is listed on the placeholder page and each Document ID for each page of the document is reflected in metadata. The placeholder pages must be OCR'd as any other paper record, as described above. For each document withheld as privileged, whether in entirety or in part, the Company shall code the substitute document submitted as specified in and provide as metadata the information in the attached MetaData Table of Requested Fields.
9. For each Document identified on the Company privilege log:
 - 1) Provide the document control number(s);
 - 2) Identify all authors of the document;
 - 3) Identify all addressees of the document;
 - 4) Identify all recipients of the document or of any copies of the document, to the extent not included among the document's addressees;
 - 5) Provide the date of the document;
 - 6) Provide a description of the subject matter of the document;
 - 7) State the nature or type of the privilege that the Company is asserting for the document (e.g., "attorney-client privilege");
 - 8) Provide the number(s) of the Request to which the document is responsive;
 - 9) Provide the document control number(s) of any attachments to the document, regardless of whether any privilege is being asserted for such attachment(s); and
 - 10) State whether the document has been produced in redacted form, and include the range of Document ID labels for those produced documents.
10. The Company's privilege log shall also conform with all of the following requirements:
 - 1) Provide a separate legend identifying each author, addressee, and recipient identified on the Company's privilege log.
 - 2) Identify on the privilege log, and denote with an asterisk, all attorneys acting in a legal capacity with respect to the withheld document or communication.
 - 3) The description of the subject matter of each document shall describe the nature of the document in a manner that, though not revealing information that is itself privileged, provides sufficiently detailed information to enable the Commission to assess the applicability of the privilege claimed.
 - 4) For each document withheld under a claim that it constitutes or contains attorney work product, also state whether the Company asserts that the document was prepared in anticipation of litigation or for trial and, if so, specify the anticipated litigation or trial upon which the assertion is based.
 - 5) Produce all nonprivileged portions of any responsive document (including nonprivileged or redactable attachments) for which a claim of privilege is asserted, except where the only nonprivileged information in the document has already been produced. Note where any redactions in the document have been made.
 - 6) The privilege log shall be produced in both hardcopy and electronic form, the electronic form of which shall be both searchable and sortable.

- 7) Documents sent solely between counsel, including in-house counsel acting solely in a legal capacity, and documents authored by the Company's outside counsel that were not directly or indirectly furnished to any third party, such as internal law firm memoranda, may be omitted from the privilege log. However, any attachments to such documents must be included on the privilege log (if a privilege is applicable to such materials), unless such attachments are addressed and sent solely to counsel.

Instructions for Submission of Electronic Documents

A. Form of Production

1. Electronic documents shall be produced in Summation Enterprise load files as images and/or native format files with extracted text and related metadata and bibliographic information. A list of metadata fields that must be populated, as relevant, is attached. Specific requirements for different types of documents are discussed below. Please contact Commission staff for further technical specifications.

2. Each submission shall be accompanied by an index, in hard copy and electronic form, detailing what has been produced, by custodian and Bates number, along with information to confirm that the Commission has received everything that you intended to send.

3. To minimize any delay in loading your submissions, each submission shall be as large as practical under these specifications, while also maintaining a timely and rolling production. However, load file volumes shall not contain more than 100,000 records.

4. Subsequent submissions shall not include information produced in previous submissions, unless specifically requested by the Commission.

5. The submission preferably shall be on a portable hard drive or DVD-ROM, depending on the volume, appropriately labeled with the submission(s) contained on the media. The Commission cannot return any submission, nor can it accept productions over the Internet.

6. A web-based, hosted production is not likely to be possible due to technical issues related to the Commission's firewall.

B. Document Types

1. Hard-copy (or paper) documents.

(a) Except as otherwise agreed, hard-copy documents shall be produced as image files with related searchable OCR text and bibliographic information.

(b) Some documents may more appropriately and efficiently be produced in hard-copy form (*e.g.*, maps).

(c) Special care should be taken to properly unitize documents, maintain attachment relationships, and indicate file folder or binder labels, consistent with the Definitions and Instructions.

2. E-mail and Other Electronic Messages.

(a) E-mail and other electronic messages (*e.g.*, instant messages ("IMs")) shall be produced as image files with related searchable text and metadata and bibliographic information.

(b) Each IM conversation shall be produced as one document.

(c) E-mail metadata shall include the folderpath ("folder" field) information for e-mail file folders into which a custodian's e-mail messages have been organized. Be sure to preserve and produce this information as specified. Beware of copying e-mails into an electronic repository or forwarding

them to a central e-mail box, as such processes may destroy this information. *See also infra* Section C(2) regarding custodian metadata.

(d) Depending on how the Company's systems represent names in e-mail messages or IMs, the Commission may require a table of names or contact lists.

3. Spreadsheets shall be produced in native format (*e.g.*, .XLS files) with the first page imaged and with related searchable text and metadata and bibliographic information.

4. Presentations.

(a) Presentations shall be produced as images that show the full slide images and speaker notes, with related searchable text and metadata and bibliographic information.

(b) Presentations shall also be produced in native format (*e.g.*, .PPT files).

5. Word processing and other electronic documents not specifically addressed elsewhere in this letter shall be produced as image files with related searchable text and metadata and bibliographic information.

6. Databases.

(a) This letter does not address enterprise databases which may be responsive to the Information and Document Requests and should be the subject of a separate discussion once you have identified them.

(b) Smaller databases (*e.g.*, Microsoft Access) that are responsive should be produced, but not as part of the load-file production. Such databases should be produced separately.

7. Company Intranets and Social Networking Sites.

(a) If the Company's intranet or company social networking content (*e.g.*, Facebook, Twitter) contains responsive information, production of these items should be the subject of a separate discussion.

(b) Depending on the nature of the information, it may be appropriate to provide the Commission direct access to the Company's intranet via a secure Internet connection, but significant technical issues are often involved.

8. Embedded files with no substantive content (*e.g.*, corporate logos, executive "head-shot" photographs, stationery address blocks), which would appear in the production as an otherwise blank and therefore unresponsive "TIFF" image, should not be produced.

C. General Issues

1. Attachments and their parent documents are a "family" of documents. Families of documents (*e.g.*, a cover e-mail with multiple attachments) must all be produced in full. If one member of the family is responsive, the entire family is considered responsive, and individual documents in the family cannot be withheld on grounds of being "non-responsive."

2. The required metadata for each electronic document includes “custodian” information (typically, the name of the human person from whose files the document was gathered) and “filepath” information for directory/server folders into which a custodian’s documents have been organized. Ensure that you are collecting this information when collecting responsive documents. If the Company stores documents in a repository that does not maintain personal custodian or filepath information (*e.g.*, that “journals” e-mails), it shall be required to stipulate to custodian identities for purposes of using documents.

3. In certain circumstances, a custodian may be a shared resource (*e.g.*, shared drive or server, shared filing cabinet). Materials gathered from such repositories, to which multiple people have access, shall be produced as separate custodians. The Company shall provide a brief description of each shared resource that includes a list of the employees who have access to that shared resource. The documents in shared resources should otherwise be produced as described in the rest of this letter. (Personal share or server drives are not shared resources and shall be produced as part of each human custodian’s files.)

4. Native Format Files

(a) If any native files will be produced that cannot be viewed using the standard configuration of Microsoft Office 2007, Adobe Acrobat Reader 9, WordPerfect X4, or Internet Explorer 7, you will need to notify the Commission so it can determine whether it has the appropriate software and licenses to view those files. If it does not, it may be necessary for the Company to provide that software.

(b) Any encryption or password protection shall be removed from all native format files produced.

5. Images and Text Files

(a) Images of the produced electronic documents shall conform with any further specifications provided by the Commission.

(b) Searchable OCR and extracted text from the produced electronic documents shall conform with any further specifications provided by the Commission.

(c) Care should be taken to ensure that the text files will properly format and wrap.

(d) If any document cannot be interpreted in image/text format (*e.g.*, color, Microsoft Project), the Commission may request that it be produced natively, or the Company can contact the Commission to discuss producing them natively. As noted above in C(4)(a), the Company may need to provide the appropriate software in order for the Commission to view these documents.

6. Deduplication

(a) The Company shall deduplicate vertically within each custodian’s files.

(b) The Commission prefers that the Company also deduplicate horizontally across all custodians’ files, but only if:

(i) the deduplication methodology preserves information on BCC recipients of e-mail;

(ii) custodian information from suppressed duplicates can be preserved and produced as a custodian append file; and

(iii) the Company, prior to beginning its production, provides a written description its deduplication methodology, including how custodial and BCC information shall be preserved and produced, to which the Commission agrees.

(c) The Company must produce all members of a family of documents (*see* C(1)) and cannot suppress attachments to other documents. In other words, the integrity of families of documents must be maintained, except as limited by any claim of privilege.

(d) The Company agrees not to raise any objections to the Commission's use of the produced duplicate in relation to whether it was in the files of the custodians who had the suppressed duplicates in their files or were the sender or recipients of any e-mail.

7. Privilege Designations

(a) Documents redacted pursuant to any claim of privilege shall be designated "Redacted" in the Properties field in the metadata and bibliographic information provided. The Company shall provide appropriately redacted related searchable text, metadata, and bibliographic information for these documents.

(b) Documents withheld pursuant to any claim of privilege that are part of a document family shall include a designation of "Family Member of Priv Doc" in the Properties field in the metadata and bibliographic information provided for all the other documents in its family. A placeholder image with a Bates number should be provided in place of the document.

(c) Both redacted and withheld documents shall appear on the privilege log. Each withheld document from a family shall include the family Bates number range in its entry on the privilege log.

8. Bates Numbering

(a) A consistent format for Bates numbering shall be used across the entire production. Bates numbers should contain no more than three segments – *e.g.*, a company identifier, a middle segment (*e.g.*, custodian identifier), and a sequence of 6-8 digits (the number of digits should be consistent across the entire production).

(b) Bates numbers should not contain embedded spaces (" "), slashes ("/"), backslashes ("\"), or underscores ("_"). Bates numbers may contain hyphens ("-").

(c) Native format files should be assigned a Bates number; if images have been produced with a native format file, the beginning Bates number of the images should be the native format file's Bates number.

9. These instructions do not address or endorse any search method the Company may use to identify responsive electronic documents.

10. In order to ensure the Company's full technical and procedural compliance with these instructions, the Company shall make its Information Technology personnel and those of its vendors available to Commission staff for consultation and coordination before, during, and after its production of materials responsive to the requests.

D. Sample Submission Required Prior to Full Production

In consultation with Commission staff, the Company shall submit a test submission to ensure proper configuration of data for uploading into the Commission's Summation Enterprise database server before the Company "ramps up" production. To minimize the likelihood of encountering problems during full production, the sample must be representative of an actual production, including multiple types of documents, documents with attachments ("families"), document families from which an item has been removed pursuant to privilege (and replaced with a Bates-numbered, placeholder image), redacted documents with appropriately related searchable text, and presentation documents with speaker notes.

| FIELD LISTING FOR SUMMATION METADATA LOAD FILE | | | TYPE OF RECORD(S) TO WHICH EACH FIELD APPLIES | | | |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------|--------|--------------------------------|-------------------------------------------------------------|
| Field Name | Field Description | Field Type | Hard Copy | E-Mail | Spreadsheets and Presentations | Other E-Docs (all Attachments, Calendar Appts, Loose Files) |
| COMPANIES | Company submitting data | Multi-Entry | x | x | x | x |
| SUBMISSION# | Production volume number (e.g., ABC001) | Note Text | x | x | x | x |
| REQUEST# | Request(s) to which the document is responsive | Multi-Entry | x | x | x | x |
| CUSTODIAN | Custodian(s) / source(s) -- format: Last, First or ABC Dept | Multi-Entry | x | x | x | x |
| BEGDOC# | Start Bates (including prefix) -- do not use commas, underscores, ampersands, slashes, spaces, characters not allowed in Windows file names or any character used as a delimiter in the load files as part of this number | Note Text | x | x | x | x |
| ENDDOC# | End Bates (including prefix) -- do not use commas, underscores, ampersands, slashes, spaces, characters not allowed in Windows file names, or any character used as a delimiter in the load file as part of this number | Note Text | x | x | x | x |
| DOCID | Must equal the value appearing in the BEGDOC# field | Note Text | x | x | x | x |
| NUMPAGES | Page count | Integer | x | x | x | x |
| PARENTID | Parent record's BEGDOC#, including prefix (populated ONLY in child records) | Note Text | x | x | x | x |
| ATTACHMENTIDS | Child document list: BEGDOC# of each child (populated ONLY in parent records) | Multi-Entry | x | x | x | x |
| BATESRANGE | BEGDOC# value of the parent record and ENDDOC# value (including prefix) of the last child record (for example, ABC-001 - ABC-020); populated for all documents in the group - otherwise, remains empty | Note Text | x | x | x | x |
| EPROPERTIES | Indicate All That Apply : Record Type: Loose File, E-mail, Attachment, Hard Copy, Calendar Appt Privilege Notations: Redacted, Privileged, Family Member of Priv Doc | Multi-Entry | x | x | x | x |
| PRIV | Privileged (Y/N) | Note Text | x | x | x | x |
| PO1 | Subject to First Protective Order (Y/N) | Note Text | x | x | x | x |
| PO2 | Subject to Second Protective Order (Y/N) | Note Text | x | x | x | x |
| FROM | Author of the e-mail or loose electronic file (as formatted on the original) | Note Text | | x | x | x |
| TO | Recipients of the e-mail (as formatted on the original) | Multi-Entry | | x | | |
| CC | Names of the individuals who were copied on the e-mail (as formatted on the original) | Multi-Entry | | x | | |
| BCC | Names of the individuals who were blind-copied on the e-mail (as formatted on the original) | Multi-Entry | | x | | |
| SUBJECT | E-mail or calendar subject, or electronic file's document title | Note Text | | x | x | x |
| DATESENT | Date the e-mail was sent - YYYYMMDD | Date | | x | | |
| TIMESENT | Time e-mail was sent -- HH:MM am/pm (e.g., 09:32 am; Timezone indicators cannot be included) | Time | | x | | |
| DATERECEIVED | Date e-mail was received - YYYYMMDD | Date | | x | | |
| TIMERECEIVED | Time e-mail was received -- HH:MM am/pm | Time | | x | | |
| HEADER | The internet header information for e-mail sent through the internet; | Note Text | | x | | |
| INTERNETMSGID | Internet message identification number | Note Text | | x | | |
| MESSAGEID | Unique system identification number for the e-mail message | Note Text | | x | | |
| DATECREATED | Date electronic file was created - YYYYMMDD | Date | | | x | x |
| DATESAVED | Date electronic file was last modified - YYYYMMDD | Date | | | x | x |
| DOCDATE | Populate with: DATESAVED for electronic files (loose files and e-mail | Date Keyed | x | x | x | x |

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|---------------|--------------------------------------------------------------------------------------------|----------------------|---|---|---|---|
| | attachments) ; DATESENT for e-mails; or DATEAPPTSTART for calendar appointments - YYYYMMDD | | | | | |
| DATEAPPTSTART | Start date of calendar appointment - YYYYMMDD | Date | | | | x |
| TIMEAPPTSTART | Start time of calendar appointment - HH:MM am/pm | Time | | | | x |
| DATEAPPTEND | End date of calendar appointment - YYYYMMDD | Date | | | | x |
| TIMEAPPTEND | End time of calendar appointment -- HH:MM am/pm | Time | | | | x |
| FILESIZE | File size (numeric value only - do not include unit of measure) | Integer | | x | x | x |
| ATTACHTITLE | File name of an e-mail, e-mail attachment, or loose electronic document | Note Text | | x | x | x |
| APPLICATION | Application used to create native file (e.g., Excel, Outlook, Word) | Note Text | | x | x | x |
| FILEEXTENSION | File extension of native electronic file | Fixed Length 5 chars | | x | x | x |
| FILEPATH | File path to native file as it existed in original environment | Note Text | | x | x | x |
| DOCLINK | Current file path location to the native file (on the delivery medium) | Note Text | | | x | |
| FOLDER | E-mail folder path (sample: Inbox\Active); or Hard Copy folder/binder title/label | Note Text | x | x | | |
| HASHMD5 | MD5 hash value (used for deduplication or other processing) | Note Text | | x | x | x |
| HASHSHA | SHA1 hash value (used for deduplication or other processing) | Note Text | | x | x | x |
| SEARCHVALUES | List of search terms used to identify record as responsive (if used) | Multi-Entry | x | x | x | x |
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