

3GPP2 C.S0097-0

Version 1.0

April, 2010



**3RD GENERATION
PARTNERSHIP
PROJECT 2
"3GPP2"**

E-UTRAN – cdma2000 1x Connectivity and Interworking Air Interface Specification

© 2010 3GPP2

3GPP2 and its Organizational Partners claim copyright in this document and individual Organizational Partners may copyright and issue documents or standards publications in individual Organizational Partner's name based on this document. Requests for reproduction of this document should be directed to the 3GPP2 Secretariat at secretariat@3gpp2.org. Requests to reproduce individual Organizational Partner's documents should be directed to that Organizational Partner. See www.3gpp2.org for more information.

Revision History

Revision	Description Of Changes	Date
Rev 0 v1.0	Publication	April 2010

CONTENTS

1		
2	FOREWORD.....	v
3	REFERENCES.....	vi
4	1 Overview	1-1
5	1.1 Introduction	1-1
6	1.2 Scope of This Document	1-1
7	1.3 Requirement Language	1-1
8	1.4 Architecture Reference Model for cdma2000 1x Interworking	1-2
9	1.5 Terms	1-3
10	1.6 Notation	1-4
11	2 Generic Circuit Services Notification Application Protocol.....	2-1
12	2.1 Protocol Overview	2-1
13	2.2 Mobile Station Procedures	2-2
14	2.3 IWS Procedures	2-5
15	2.4 GCSNA Message Formats	2-7
16	2.4.1 GCSNA1xCircuitService	2-7
17	2.4.1.1 TLACEncapsulated1xL3PDU format	2-9
18	2.4.2 GCSNAL2Ack	2-12
19	2.4.3 GCSNAServiceReject	2-12
20	2.4.4 GCSNA1xParametersRequest	2-13
21	2.4.5 GCSNA1xParameters.....	2-14
22	2.4.6 GCSNA1xParametersAck.....	2-15
23	3 CDMA2000Parameters	3-1
24	4 E-UTRAN and 1x interworking.....	4-1
25	4.1 GCSNA1xParameters Requirement for Interworking with E-UTRAN.....	4-1
26	4.2 MobilityParametersCDMA2000 definition for E-UTRAN	4-1
27	4.3 Requirements for Transmission and Reception of 1x messages.....	4-1
28	4.4 Notification to cdma2000 1x Base Station	4-1
29	4.5 E-UTRAN Neighbor Record Processing for 1x.....	4-2
30	4.5.1 E-UTRAN Neighbor Channels Management and E-UTRAN Idle Channel	
31	Reselection Procedures	4-2
32	4.5.1.1 E-UTRAN Neighbor List Management and E-UTRAN Frequency	
33	Channel Measurement.....	4-2

1 4.5.1.2 E-UTRAN Cell Reselection Procedures in the Idle State..... 4-3
2 4.5.1.2.1 EUTRAREselectTimer value 4-4
3 4.5.2 E-UTRAN neighbor records format 4-4
4 4.5.2.1 E-UTRAN Neighbor List Record..... 4-4
5 4.6 1xCSFB Access Barring Support 4-10
6 4.7 1x to E-UTRAN Handoff..... 4-10
7 4.7.1 Base Station support for Idle Handoff to E-UTRAN 4-10
8 4.7.2 Mobile Station support for Idle Handoff to E-UTRAN 4-10
9 4.8 MEID Support 4-10
10

FIGURES

1
2
3
4
5

Figure 1.4-1. Architecture Reference Model..... 1-2
Figure 1.4-2. Reference Architecture for E-UTRAN - cdma2000 1x Interworking 1-3
Figure 2.1-1. Protocol Architecture Reference Model 2-1

TABLES

1
2
3
4

Table 2.4.1-1 GCSNAOption Subfields 2-8

Table 4.5.2-1 Measurement Bandwidth..... 4-9

FOREWORD**(This foreword is not part of this standard)**

This standard was prepared by Technical Specification Group C of the Third Generation Partnership Project 2 (3GPP2). This standard is evolved from and is a companion to the cdma2000^{®1} standards. This standard contains the air interface requirements for facilitating Generic Circuit Service Notification Application and cdma2000 1x interworking with the Evolved Universal Terrestrial Radio Access Network (E-UTRAN). This specification applies to cdma2000 1x compliant mobile stations and base stations which are enhanced to support the E-UTRAN and cdma2000 1x interworking.

This is a supplementary specification to cdma2000 1x air interface specifications.

¹ “cdma2000[®] is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) of 3GPP2. Geographically (and as of the date of publication), cdma2000[®] is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States.”

1 **REFERENCES**

2 The following standards contain provisions which, through reference in this text, constitute
 3 provisions of this standard. At the time of publication, the editions indicated were valid. All
 4 standards are subject to revision, and parties to agreements based on this standard are
 5 encouraged to investigate the possibility of applying the most recent editions of the
 6 standards indicated below.

- 7
- 8 [1] 3GPP TS 23.272: “Circuit Switched Fallback in Evolved Packet System; Stage 2”.
- 9 [2] 3GPP TS 36.133: “Evolved Universal Terrestrial Radio Access (E-UTRA);
 10 Requirements for support of radio resource management ”.
- 11 [3] 3GPP TS 36.304: “Evolved Universal Terrestrial Radio Access (E-UTRA); User
 12 Equipment (UE) procedures in idle mode”.
- 13 [4] 3GPP TS 36.331: “Evolved Universal Terrestrial Radio Access (E-UTRA) Radio
 14 Resource Control (RRC) Protocol specification”.
- 15 [5] 3GPP TS 36.413: “Evolved Universal Terrestrial Radio Access Network (E-UTRAN);
 16 S1 Application Protocol (S1AP)”.
- 17 [6] 3GPP2 A.S0008-C: “Interoperability Specification (IOS) for High Rate Packet Data
 18 (HRPD) Radio Access Network Interfaces with Session Control in the Access
 19 Network”.
- 20 [7] 3GPP2 A.S0009-C: “Interoperability Specification (IOS) for High Rate Packet Data
 21 (HRPD) Radio Access Network Interfaces with Session Control in the Packet Control
 22 Function”.
- 23 [8] 3GPP2 C.R1001: “Administration of Parameter Value Assignments for cdma2000
 24 Spread Spectrum Standards” (Informative reference).
- 25 [9] 3GPP2 C.S0002-E: “Physical Layer Standard for cdma2000 Spread Spectrum
 26 Systems”.
- 27 [10] 3GPP2 C.S0003-E: “Medium Access Control (MAC) Standard for cdma2000 Spread
 28 Spectrum Systems”.
- 29 [11] 3GPP2 C.S0004-E: “Signaling Link Access Control (LAC) Standard for cdma2000
 30 Spread Spectrum Systems”.
- 31 [12] 3GPP2 C.S0005-E: “Upper Layer (Layer3) Signaling Specification for cdma2000
 32 Spread Spectrum Systems”.
- 33 [13] 3GPP2 C.S0024-B v3.0: “cdma2000 High Rate Packet Data Air Interface
 34 Specification”.
- 35 [14] 3GPP2 C.S0057: “Band Class Specification for cdma2000 Spread Spectrum
 36 Systems”.
- 37 [15] 3GPP2 C.S0082: “Circuit Services Notification Application Specification for
 38 cdma2000 High Rate Packet Data”.
- 39 [16] 3GPP2 C.S0087-0 v2.0: “E-UTRAN – cdma2000 HRPD Connectivity and
 40 Interworking: Air Interface Specification”

1

2 **1 OVERVIEW**

3 **1.1 Introduction**

4 These technical requirements form a compatibility standard for facilitating cdma2000 1x
5 tunneling through any other Radio Access Technology (RAT), but not through HRPD. This
6 technical specification also forms requirements on the Evolved Universal Terrestrial Radio
7 Access Network (E-UTRAN) and cdma2000 1x Interworking.

8 **1.2 Scope of This Document**

9 This specification applies to cdma2000 mobile stations and base stations, which are enhanced
10 to support the E-UTRAN and cdma2000 1x interworking and Interworking Solution (IWS).

11 These requirements ensure that a compliant mobile station can obtain interworking service
12 through any base station conforming to this standard. These requirements do not address the
13 quality or reliability of that service, nor do they cover equipment performance or measurement
14 procedures.

15 This specification is primarily oriented toward requirements necessary for the design and
16 implementation of mobile station. As a result, detailed procedures are specified for mobile
17 station to ensure a uniform response to all base station or IWSs. Base station and IWSs
18 procedures, however, are specified only to the extent necessary for compatibility with those
19 specified for the mobile station.

20 This specification includes provisions for future service additions and expansion of system
21 capabilities. The architecture defined by this specification permits such expansion without the
22 loss of backward compatibility to older mobile stations.

23 **1.3 Requirement Language**

24 Compatibility, as used in connection with this standard, is understood to mean: Any mobile
25 station can obtain service through any base station or IWS conforming to this standard.
26 Conversely, all base stations or IWSs conforming to this standard can service mobile stations.

27 “Shall” and “shall not” identify requirements to be followed strictly to conform to the standard
28 and from which no deviation is permitted. “Should” and “should not” indicate that one of
29 several possibilities is recommended as particularly suitable, without mentioning or excluding
30 others, that a certain course of action is preferred but not necessarily required, or that (in the
31 negative form) a certain possibility or course of action is discouraged but not prohibited. “May”
32 and “need not” indicate a course of action permissible within the limits of the standard. “Can”
33 and “cannot” are used for statements of possibility and capability, whether material, physical,
34 or causal.

1.4 Architecture Reference Model for cdma2000 1x Interworking

The architecture reference model for inter radio access technology interworking is presented in Figure 1.4-1. The reference model consists of the following functional units: the cdma2000 mode of the dual mode mobile stations, the cdma2000 base station and the Tunnel.

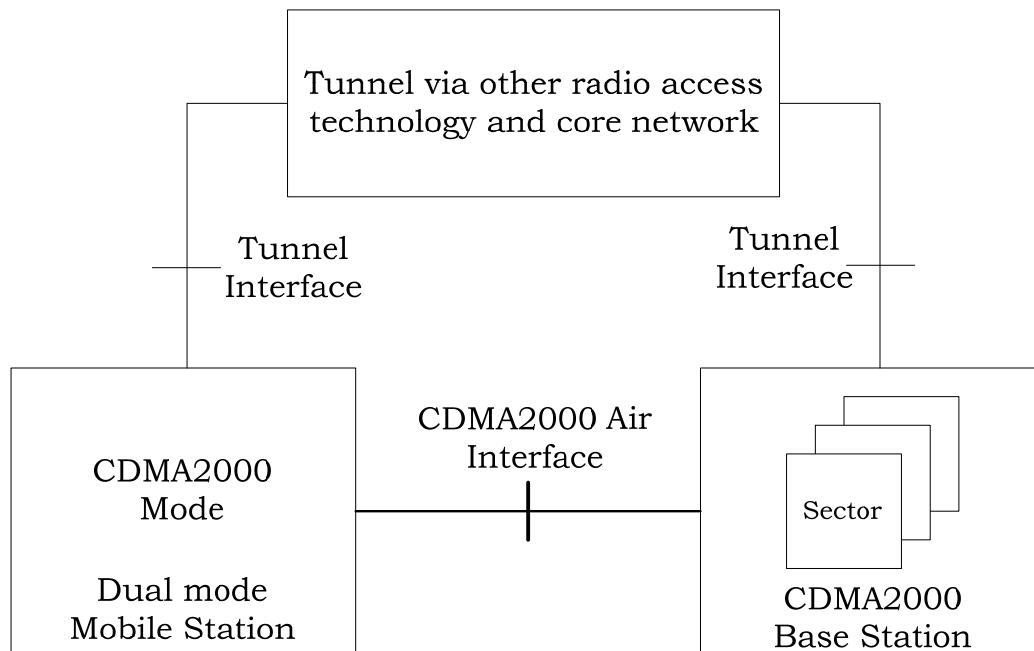


Figure 1.4-1. Architecture Reference Model

The cdma2000 mode of the dual mode mobile stations and the cdma2000 base station are defined in section 1.5. The Tunnel involves the dual mode mobile stations, air interface and base station associated with the other radio access technology, as well as the core networks.

The reference model includes the cdma2000 air interface [9], [10], [11], and [12] between the dual mode mobile station and the cdma2000 base station, the tunnel interface between the Tunnel and the cdma2000 mode of the dual mode mobile station, and the tunnel interface between the Tunnel and the cdma2000 base station.

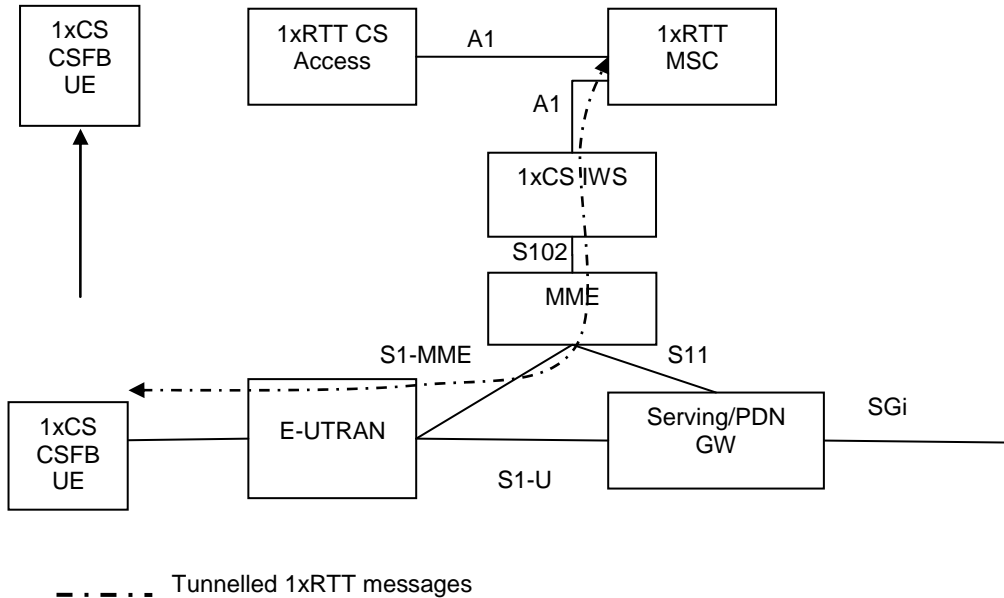


Figure 1.4-2. Reference Architecture for E-UTRAN - cdma2000 1x Interworking

Note: Figure 1.4-2 Reference Architecture for cdma2000 1x Interworking with E-UTRAN is included only for information.

The elements related to the Tunnel Interface shown in Figure 1.4-2 are specified in [4], [5], [6], and [7].

1.5 Terms

Base Station. A fixed station used for communicating with mobile stations. Depending upon the context, the term base station may refer to a cell, a sector within a cell, an MSC, or other part of the wireless system.

cdma2000 Mode of Dual Mode Mobile Station. An operation mode of a dual mode mobile station which provides the connectivity over the cdma2000 1x air interface. A dual mode mobile station may operate in the cdma2000 mode or the mode of another radio access technology such as E-UTRAN.

Code Division Multiple Access (CDMA). A technique for spread-spectrum multiple-access digital communications that creates channels through the use of unique code sequences.

Circuit Switched Fallback (CSFB), The circuit switched fallback for cdma2000 1x enables the delivery of circuit switched domain services (e.g. circuit switched voice, Short Message Services) by reuse of the 1x circuit switched infrastructure when the mobile station is served by E-UTRAN.

EARFCN. Evolved Absolute Radio Frequency Channel Number.

E-UTRAN. Evolved Universal Terrestrial Radio Access Network.

Interworking Solution (IWS). The IWS Function is logically collocated at the 1x BS or the AN, or as a standalone entity. Refer to [6] and [7] for the definition.

- 1 **Mobile Station.** A station in the Public Wireless Radio Telecommunications Service intended
 2 to be used while in motion or during halts at unspecified points. Mobile stations include
 3 portable units (e.g., hand-held personal units) and units installed in vehicles. A mobile station
 4 consists of two parts – ME and UIM.
- 5 **NULL.** A value which is not in the specified range of the field.
- 6 **PDN-GW.** Packet Data Network Gateway.
- 7 **PLMN.** Public Land Mobile Network.
- 8 **RC.** Radio Configuration
- 9 **TLAC.** Tunnel Link Access Control

10 1.6 Notation

- 11 **A[i]** The i^{th} element of array A. The first element of the array is A[0].
- 12 **$\langle e_1, e_2, \dots, e_n \rangle$** A *structure* with elements 'e₁', 'e₂', ..., 'e_n'.
 13 Two structures $E = \langle e_1, e_2, \dots, e_n \rangle$ and $F = \langle f_1, f_2, \dots, f_m \rangle$ are equal if and
 14 only if 'm' is equal to 'n' and e_i is equal to f_i for $i=1, \dots, n$.
 15 Given $E = \langle e_1, e_2, \dots, e_n \rangle$ and $F = \langle f_1, f_2, \dots, f_m \rangle$, the assignment "E = F"
 16 denotes the following set of assignments: $e_i = f_i$, for $i=1, \dots, n$.
- 17 **S.e** The member of the structure 'S' that is identified by 'e'.
- 18 **M[i:j]** Bits i^{th} through j^{th} inclusive ($i \geq j$) of the binary representation of variable
 19 M. M[0:0] denotes the least significant bit of M.
- 20 **|** Concatenation operator. (A | B) denotes variable A concatenated with
 21 variable B.
- 22 **×** Indicates multiplication.
- 23 **$\lfloor x \rfloor$** Indicates the largest integer less than or equal to x: $\lfloor 1.1 \rfloor = 1, \lfloor 1.0 \rfloor = 1$.
- 24 **$\lceil x \rceil$** Indicates the smallest integer greater or equal to x: $\lceil 1.1 \rceil = 2, \lceil 2.0 \rceil = 2$.
- 25 **|x|** Indicates the absolute value of x: $|-17| = 17, |17| = 17$.
- 26 **\oplus** Indicates exclusive OR (modulo-2 addition).
- 27 **\otimes** Indicates bitwise logical AND operator.
- 28 **min (x, y)** Indicates the minimum of x and y.
- 29 **max (x, y)** Indicates the maximum of x and y.
- 30 **x mod y** Indicates the remainder after dividing x by y: $x \text{ mod } y = x - (y \times \lfloor x/y \rfloor)$.

1 x^y Indicates the result of x raised to the power y, also denoted as x^y .

2 x^y Indicates the result of x raised to the power y, also denoted as x^y .

3 Unless otherwise specified, the format of field values is unsigned binary.

4 Unless indicated otherwise, this standard presents numbers in decimal form. Binary numbers
5 are distinguished in the text by the use of single quotation marks. Hexadecimal numbers are
6 distinguished by the prefix '0x'.

7 Unless specified otherwise, each field of a packet shall be transmitted in sequence such that
8 the most significant bit (MSB) is transmitted first and the least significant bit (LSB) is
9 transmitted last. The MSB is the left-most bit in the figures in this document. If there are
10 multiple rows in a table, the top-most row is transmitted first. If a table is used to show the
11 sub-fields of a particular field or variable, the top-most row consists of the MSBs of the field.
12 Within a row in a table, the left-most bit is transmitted first. Notations of the form "repetition
13 factor of N" or "repeated N times" mean that a total of N versions of the item are used.

1 This page intentionally left blank.

2

2 GENERIC CIRCUIT SERVICES NOTIFICATION APPLICATION PROTOCOL

2.1 Protocol Overview

The Generic Circuit Services Notification Application (GCSNA) Protocol supports signaling transactions for cdma2000 1x circuit-switched services between the mobile station and the 1xCS IWS through any radio access technologies which provides a tunnel between the mobile station and IWS (hereafter ‘a tunnel’) except for the cdma2000 high rate packet data system².

Figure 2.1-1 describes the protocol architecture reference model.

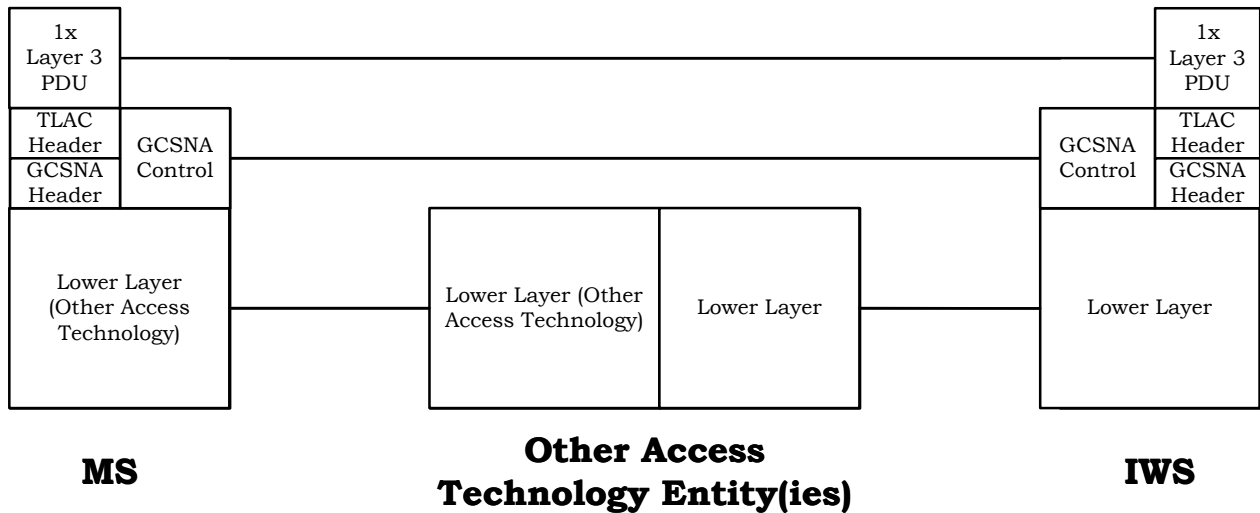


Figure 2.1-1. Protocol Architecture Reference Model

In this specification, the term IWS is used without regard to the placement of the IWS (standalone, collocated with the base station controller, etc). The IWS provides the following functions:

- **Message Translation:** This function translates between IOS A1/A1p messages received from/sent to a Mobile Switching Center (MSC) and 1x air interface signaling messages sent/received over other access technology.
- **1x Parameters Storage:** This optional function stores 1x radio parameters required for GCSNA support.
- **RAND Generation:** This optional function provides the random challenge value (RAND) used for 1x authentication. This function may be in the other access technology. If the IWS supports RAND generation and 1x parameter provisioning, a RAND value provided by the IWS to the mobile station takes precedence over a RAND value provided to the mobile station by a node in the other access technology.

² In cdma2000 HRPD, 3G1X Circuit Service Notification Application [15] is used.

1 This protocol provides the following functions:

- 2 • 1x Layer 3 Protocol Data Unit (PDU) [12] encapsulation with a Tunneled Link Access
3 Control (TLAC) header and further encapsulated with a GCSNA header.
- 4 • Optional 1x parameters provisioning

5 GCSNA does not support the dynamic configuration of a filtering mechanism that allows
6 notifications associated with only certain circuit switched services to be sent through a tunnel
7 provided by other access technology. GCSNA only supports the static configuration. The
8 GCSNAOption specified in [8] defines circuit switched services that can be provided.

9 **2.2 Mobile Station Procedures**

10 When the mobile station sends a TLAC encapsulated 1x Layer 3 PDU [12] to the IWS over a
11 tunnel:

- 12 • It shall encapsulate the 1x Layer 3 PDU in the *GCSNA1xCircuitService* message.
- 13 • The first time the mobile station sends a *GCSNA1xCircuitService* message, it shall set
14 the *GCSNAOption* field to the most preferred *GCSNAOption* for an interworking
15 scenario as defined in [8].
- 16 • If *GCSNAOption* in use is known, the mobile station shall use it to send a
17 *GCSNA1xCircuitService* message.
- 18 • If the *GCSNAOption* in use has been changed, the mobile station may propose a more
19 preferred *GCSNAOption* by setting the *GCSNAOption* field when it sends the
20 *GCSNA1xCircuitService* message with an incremented *MessageSequence* number.
- 21 • If the mobile station sends the *GCSNA1xCircuitService* message with the *AckRequired*
22 bit set to '1', the mobile station shall start a timer set to *GCSNAL2AckTimer*. If the timer
23 expires, the mobile station may resend the *GCSNA1xCircuitService* message. The
24 number of retransmissions is implementation specific.
- 25 • If the *MessageSequence* number has been reset, the mobile station shall set the
26 *StopDupDetect* bit to '1'. Triggers for reset are implementation specific.

27 When the mobile station receives a GCSNA message:

- 28 • It shall check the received *MessageID*. If the *MessageID* is known, the mobile station
29 shall follow the requirements for parsing this GCSNA message.
- 30 • If it does not understand the GCSNA *MessageID*, the mobile station shall send the
31 *GCSNAServiceReject* message with the cause value set to "InvalidMessageID".

32 When the mobile station receives the *GCSNA1xCircuitService* message from IWS:

- 33 • It shall check the received *GCSNAOption* and *1xProtocolRevision*.
 - 34 ○ If mobile station cannot accept *1xProtocolRevision*, the mobile station shall
35 send the *GCSNAServiceReject* message with a cause value set to the "Invalid
36 *1xProtocolRevision*". If the mobile station can accept neither the *GCSNAOption*
37 nor the *AlternativeGCSNAOption*, then the mobile station shall send the
38 *GCSNAServiceReject* message with a cause value set to the "Invalid

GCSNAOption". If the mobile station can accept neither the GCSNAOption, nor the AlternativeGCSNAOption, nor 1xProtocolRevision, then the mobile station shall send the *GCSNAServiceReject* message with cause value set to "Invalid GCSNAOption and 1xProtocolRevision". If the mobile station sends *GCSNAServiceReject* message with Cause value set to '00000000' or '00000010', the mobile station shall put the list of GCSNAOptions it supports in order of decreasing preference in the *GCSNAServiceReject* message. If the mobile station sends *GCSNAServiceReject* message with Cause value set to '00000000', '00000001', or '00000010', the mobile station shall not start a GCSNASequenceContextTimer. If the received *GCSNA1xCircuitService* message had the AckRequired bit set to '1', then the mobile station shall not send the *GCSNAL2Ack* message.

- If mobile station can accept either GCSNAOption or AlternativeGCSNAOption and 1xProtocolRevision, the mobile station shall process the message as follows:

- If the *GCSNA1xCircuitService* message from the IWS contains a GCSNAOption that does not match to the GCSNAOption in use, the mobile station shall choose a GCSNAOption from the acceptable GCSNAOption(s) in the message and use GCSNAOption for subsequent GCSNA message exchange with same GCSNAClass and same or lower GCSNAClassRevision.

- If the received *GCSNA1xCircuitService* message had the AckRequired bit set to '1', then the mobile station shall send the *GCSNAL2Ack* message.

- It shall start a GCSNASequenceContextTimer. The mobile station shall keep the value of sequence number and IWS_ID if it is provided until GCSNASequenceContextTimer expires.

- If StopDupDetect is set to '0' in a *GCSNA1xCircuitService* message, the mobile station shall do the following:

- If a message with AckRequired is set to '0' and with the same sequence number and IWS_ID (if it is provided) is received before the associated GCSNASequenceContextTimer expires, the mobile station shall discard the message. If a message with AckRequired is set to '1' and with the same sequence number and IWS_ID (if it is provided) is received before the associated GCSNASequenceContextTimer expires, the mobile station shall send the *GCSNAL2Ack* message and discard the message. The GCSNASequenceContextTimer shall be maintained until it expires for each pair of sequence number and IWS_ID (if it is provided).

- If StopDupDetect is set to '1' in a *GCSNA1xCircuitService* message, the mobile station shall do the following:

- It should consider all the

1 GCSNASequenceContextTimer(s) have expired.

- 2 ○ It shall start a GCSNASequenceContextTimer for this
3 message.

4 When the mobile station receives a *GCSNAServiceReject* message with any cause value;

- 5 • If a *GCSNA1xCircuitService* message with AckRequired bit set to '1' is being rejected,
6 the mobile station shall abandon any retransmission procedures for the corresponding
7 message.

8 When the mobile station receives a *GCSNAServiceReject* message with the cause set to "Invalid
9 GCSNAOption" or "Invalid GCSNAOption and 1xProtocolRevision":

- 10 • If the GCSNAOption(s) included in the message contain at least one GCSNAClass that is
11 acceptable to the mobile station, then:
- 12 – From the GCSNAOption(s) included in the message, the mobile station shall select
13 most preferred GCSNAClass of the IWS that is acceptable to the mobile station.
- 14 – For the subsequent *GCSNA1xCircuitService* messages, the mobile station shall use
15 the min (IWS's GCSNAClassRevision within the selected GCSNAClass, Mobile
16 Station's GCSNAClassRevision within the selected GCSNAClass)
- 17 • Otherwise, the mobile station shall abandon the current interworking session. The
18 procedures after abandoning the interworking session are outside scope of GCSNA
19 Protocol.

20 The mobile station shall support a layer 2 acknowledgement defined in GCSNA.

21 The mobile station may support 1x parameters provisioning from the IWS. If the mobile station
22 is configured to use it, the mobile station shall send the *GCSNA1xParametersRequest* message
23 to the IWS when the mobile station needs to obtain 1x parameters. If the mobile station
24 receives a *GCSNA1xParameters* message with the UnsolicitedMessage bit set to '1' from the IWS,
25 it shall send the *GCSNA1xParametersAck* message to the IWS. If the mobile station receives a
26 *GCSNA1xParameters* message with the UnsolicitedMessage bit set to '0', it shall not send the
27 *GCSNA1xParametersAck* message to the IWS. If the mobile station does not support the 1x
28 parameters provisioning, but it receives the *GCSNA1xParameters* message, it shall send the
29 *GCSNAServiceReject* message with the cause value set to "GCSNA1xParameters provisioning is
30 not supported". If the mobile station receives unsupported RecordType of *GCSNA1xParameters*
31 message, it shall send the *GCSNAServiceReject* message with the cause value set to
32 "Unsupported RecordType in *GCSNA1xParameters* message".

33 If 1x channel assignment is received through a tunnel, the mobile station shall set the initial
34 transmission power on the 1x radio network according to the procedures specified in section
35 2.1.2.3.1.4 of [9]³ with the following parameters:

- 36 • ACC_CORRECTIONS set to NOM_PWRs – 16 × NOM_PWR_EXTs.
37 • RLGAIN_ADJs set to zero

³ This procedure for setting the initial transmission power on the 1x radio network is to be used regardless of the 1x traffic channel Radio Configuration (RC) value assigned..

2.3 IWS Procedures

When the IWS sends a TLAC encapsulated 1x Layer 3 PDU [12] to the mobile station over a tunnel:

- It shall encapsulate the 1x Layer 3 PDU in the *GCSNA1xCircuitService* message.
- It may set the IWS_ID in the *GCSNA1xCircuitService* message.
- If the GCSNAOption of the mobile station is known to the IWS and is supported by the IWS, then the IWS shall use this GCSNAOption when sending a *GCSNA1xCircuitService* message. If the GCSNAOption of the mobile station is not known to the IWS, then the IWS uses a default GCSNAOption that supports the tunneled 1x message when sending a *GCSNA1xCircuitService* message. Determination of default values is outside the scope of GCSNA Protocol.
- If the MessageSequence number has been reset, the IWS shall set the StopDupDetect bit to '1'. Triggers for reset are implementation specific.
- If the IWS sends the *GCSNA1xCircuitService* message with the AckRequired bit set to '1', the IWS shall start a timer set to GCSNAL2AckTimer. If the timer expires, the IWS may resend the *GCSNA1xCircuitService* message. The number of retransmissions is implementation specific.
- It may set AlternativeGCSNAOption(s) in the *GCSNA1xCircuitService* message. AlternativeGCSNAOption(s) shall support the 1x message being transmitted in the *GCSNA1xCircuitService* message.

When the IWS receives a GCSNA message:

- It shall check the received MessageID. If the MessageID is known, the IWS shall follow the requirements for parsing this GCSNA message.
- If it does not understand the GCSNA MessageID, the IWS shall send the *GCSNAServiceReject* message with the cause value set to "InvalidMessageID".

When the IWS receives the *GCSNA1xCircuitService* message from mobile station:

- It shall check the received GCSNAOption and 1xProtocolRevision.
 - If IWS cannot accept 1xProtocolRevision, the IWS shall send the *GCSNAServiceReject* message with a cause value set to the "Invalid 1xProtocolRevision". If the IWS can not accept the GCSNAOption, then the IWS shall send the *GCSNAServiceReject* message with a cause value set to the "Invalid GCSNAOption". If the IWS can accept neither the GCSNAOption, nor 1xProtocolRevision, then the IWS shall send the *GCSNAServiceReject* message with cause value is set to "Invalid GCSNAOption and 1xProtocolRevision". If the IWS sends *GCSNAServiceReject* message with Cause value set to '00000000', '00000001' or '00000010', the IWS shall not start a GCSNASequenceContextTimer. If the received *GCSNA1xCircuitService* message had the AckRequired bit set to '1', then the IWS shall not send the *GCSNAL2Ack* message.

- 1 o If IWS can accept GCSNAOption and 1xProtocolRevision, the IWS shall process
2 the message as follows:
- 3 ▪ If the received *GCSNA1xCircuitService* message had the AckRequired bit
4 set to '1', then the IWS shall send the *GCSNAL2Ack* message.
- 5 ▪ It shall start a GCSNASequenceContextTimer. The IWS shall keep the
6 value of sequence number until GCSNASequenceContextTimer expires.
- 7 o If StopDupDetect is set to '0' in a *GCSNA1xCircuitService* message,
8 the IWS shall do the following:
- 9 • If a message with AckRequired is set to '0' and with the
10 same sequence number is received before the associated
11 GCSNASequenceContextTimer expires, the IWS shall
12 discard the message. If a message is received with
13 AckRequired is set to '1' and the identical sequence
14 number is received before the associated
15 GCSNASequenceContextTimer has expired, the IWS shall
16 send a *GCSNAL2Ack* message and discard the message.
17 The GCSNASequenceContextTimer shall be maintained
18 until it expires for each received sequence number.
- 19 o If StopDupDetect is set to '1' in a *GCSNA1xCircuitService* message,
20 the IWS shall do the following:
- 21 • It should consider all the
22 GCSNASequenceContextTimer(s) have expired.
- 23 • It shall start a GCSNASequenceContextTimer for this
24 message.

25 When the IWS receives a *GCSNAServiceReject* message with any cause value:

- 26 • If a *GCSNA1xCircuitService* message with AckRequired bit set '1' is being rejected, then
27 the IWS shall abandon any retransmission procedure for that message.

28 When the IWS receives a *GCSNAServiceReject* message with the cause set to "Invalid
29 GCSNAOption" or "Invalid GCSNAOption and 1xProtocolRevision":

- 30 • If the GCSNAOption(s) included in the message contain at least one GCSNAClass that is
31 acceptable to the IWS, then:
- 32 – From the GCSNAOption(s) included in the message, the IWS shall select most
33 preferred GCSNAClass of the mobile station that is acceptable to the IWS.
- 34 – For the subsequent *GCSNA1xCircuitService* messages, the IWS shall use the min
35 (Mobile Station's GCSNAClassRevision within the selected GCSNAClass, IWS's
36 GCSNAClassRevision within the selected GCSNAClass)
- 37 • Otherwise, the IWS shall abandon the current interworking session. The procedures
38 after abandoning the interworking session are outside scope of GCSNA Protocol.

39 The IWS shall support layer 2 acknowledgement defined in GCSNA.

1 The IWS may support the 1x parameters provisioning. If it is supported, the IWS shall provide
 2 the set of 1x parameters in the *GCSNA1xParameters* message in response to the
 3 *GCSNA1xParametersRequest* from the mobile station. The IWS may also send unsolicited
 4 *GCSNA1xParameters* message. The IWS may determine the set of 1x parameters based on the
 5 information that the lower layer provides. It is out of scope of this document which information
 6 is provided by the lower layer. If the IWS does not support the 1x parameters provisioning, but
 7 it receives the *GCSNA1xParametersRequest* message, the IWS shall send the
 8 *GCSNAServiceReject* message. If the IWS sends the *GCSNA1xParameters* message, it shall set
 9 GCSNAL2AckTimer_Included and GCSNASequenceContextTimer_Included in the
 10 CDMA2000Parameters field to '1'.

11 **2.4 GCSNA Message Formats**

12 Further revision may add new fields to existing messages. These fields shall be added to the
 13 end of the message. The receiver shall ignore fields it does not recognize.

14 2.4.1 GCSNA1xCircuitService

15 The mobile station or IWS uses the *GCSNA1xCircuitService* message to send a cdma2000 1x
 16 Layer 3 PDU.

17

Field	Length (bits)
MessageID	8
GCSNAOption	8
AlternativeGCSNAOption_INCL	1
NumAlternativeGCSNAOptions	0 or 8

If NUMAlternativeGCSNAOptions field is included,
 NumAlternativeGCSNAOptions occurrences of the
 following field: Otherwise, 0 occurrences of the
 following field:

{

AlternativeGCSNAOption	8
------------------------	---

}

IWSIDIncl	1
IWS_ID	0 or 16
AckRequired	1
StopDupDetect	1
MessageSequence	6
Reserved	0 to 7
TLACEncapsulated1xL3PDU	Variable

18 MessageID

The sender shall set this field to 0x01.

1 GCSNAOption The sender shall set this field to a value representing a circuit switched
2 service defined in [8], according to section 2.2 or 2.3.

3 The GCSNAOption consists two subfields as listed in Table 2.4.1-1.

4 **Table 2.4.1-1 GCSNAOption Subfields**

Class Field	Length (bits)
GCSNAClass	5
GCSNAClassRevision	3

5 GCSNAClass The sender shall set this field to the GCSNA class to be set for this
6 GCSNAOption field. The GCSNAClass values are defined based on
7 [8].

8 GCSNAClassRevision

9 The sender shall set this field to the revision of the GCSNAClass to be
10 set for this GCSNAOption field. The GCSNAClassRevision values are
11 defined based on [8].

12 AlternativeGCSNAOption_INCL

13 If the AlternativeGCSNAOption field is included in this message, the IWS
14 shall set this field to '1'. Otherwise, the IWS shall set this field to '0'. The
15 mobile station shall always set this field to '0'.

16 NumAlternativeGCSNAOptions

17 If AlternativeGCSNAOption_INCL is set to '1', the IWS shall include and
18 set this field to the number of AlternativeGCSNAOptions. Otherwise the
19 sender shall omit this field.

20 AlternativeGCSNAOption

21 The IWS shall set AlternativeGCSNAOption(s) that the mobile station can
22 use for receiving the 1x message over the tunnel in the decreasing order
23 of preference. The IWS shall set this field as shown in Table 2.4.1-1.

24 IWSIDIncl The IWS shall set this field to '1' if IWS_ID field is included in the
25 message; otherwise, the IWS shall set this field to '0'. The mobile station
26 shall set this field to '0'.

27 IWS_ID If IWSIDIncl is set to '1', the IWS shall set this field to its IWS_ID;
28 otherwise, the IWS shall omit this field. IWS_ID shall be unique within
29 an operator's network.

1	AckRequired	If the receiver is required to acknowledge the reception of this message,
2		the sender shall set this field to '1'. Otherwise, the sender shall set this
3		field to '0'.
4	StopDupDetect	The sender shall set this field to '1' if the sender has reset the
5		MessageSequence number and request the
6		GCSNASequenceContextTimer(s) in the receiver to expire. Otherwise, the
7		sender shall set this field to '0'.
8	MessageSequence	The sender shall set this field to one more (modulo 64) than the
9		MessageSequence field of the last <i>GCSNA1xCircuitService</i> message that it
10		sends.
11		For first <i>GCSNA1xCircuitService</i> message after protocol initialization or
12		first <i>GCSNA1xCircuitService</i> message after the MessageSequence number
13		has been reset, the sender shall select any initial value for this field.
14	Reserved	The sender shall include reserved bits to make this message integral
15		number of octets up to TLACEncapsulated1xL3PDU field. The sender
16		shall set all bits in this field to '0'. The receiver shall ignore this field.

17 TLACEncapsulated1xL3PDU

18 The sender shall set this field as specified in section 2.4.1.1.

19 2.4.1.1 TLACEncapsulated1xL3PDU format

20 The mobile station or IWS use TLACEncapsulated1xL3PDU format described in this section to
21 encapsulate a cdma2000 1x Layer 3 PDU.

Field	Length (bits)
1xLogicalChannel	1
1xProtocolRevision	8
MsgType	8
NumTLACHeaderRecords	4

NumTLACHeaderRecords occurrences of following fields:

{

TLACHeaderRecordType	4
TLACHeaderRecordLength	8
TLACHeaderRecord	8 × TLACHeaderR ecordLength

}

Reserved	3 or 7
1xL3PDULength	16
1xL3PDU	1xL3PDULeng th × 8

- 1 1xLogicalChannel If the PDU field of this message is constructed as if for transmission on
2 the f-csch or the r-csch 1x logical channel [11], then the sender shall set
3 this field to '0'. If the PDU field of this message is constructed as if for
4 transmission on the f-dsch or the r-dsch 1x logical channel, then the
5 sender shall set this field to '1'. Refer to [11].
- 6 1xProtocolRevision The sender sets this field to the protocol revision as defined in [12] which
7 sender has used to encode the 1xL3PDU (if included) and
8 TLACHeaderRecord (if included).
- 9 MsgType The sender sets this field as follows:
- 10 r-csch: Set 2 MSBs to '00', and 6 LSBs to MSG_ID for r-csch messages
11 as defined in [11].
- 12 r-dsch: Set to 8-bit MSG_TYPE for r-dsch messages as defined in [11].
13 Mini messages are not allowed.
- 14 f-csch: Set 2 MSBs to '00', and 6 LSBs to MSG_ID for f-csch messages as
15 defined in [11].
- 16 f-dsch: Set to 8-bit MSG_TYPE for f-dsch messages as defined in [11].
17 Mini messages are not allowed.

1	NumTLACHeaderRecords	
2		The sender sets this field to the number of TLAC Header Records
3		included in this message.
4	TLACHeaderRecordType	
5		The sender sets this field to the type of TLAC Record as follows:
6		0x0: r-csch Addressing Sublayer Record
7		0x1: r-csch Authentication and Message Integrity Sublayer Record
8	TLACHeaderRecordLength	
9		The sender sets this field to the number of octets contained in
10		TLACHeaderRecord field.
11	TLACHeaderRecord	
12		The sender sets this field as follows:
13		If TLACHeaderRecordType is set to 0x0: The sender shall set this record
14		to addressing fields defined in “section 2.1.1.3.1.1 - Definition of
15		Addressing Fields” of [11]; followed by padding bits, all set to ‘0’, to
16		make the record octet aligned. The requirements to set the addressing
17		fields shall be as defined in “section 2.1.1.3.1.2 Requirements for Setting
18		the Addressing Fields” of [11].
19		If TLACHeaderRecordType is set to 0x1: The sender shall set this record
20		to fields defined in “Section 2.1.1.1.1.1 - Definition of the Authentication
21		and Message Integrity Fields” of [11]; followed by padding bits, all set to
22		‘0’, to make the record octet aligned. The requirements to set the fields
23		shall be as defined in “section 2.1.1.1.1.2 Requirements for Setting the
24		Authentication Fields” and “section 2.1.1.1.1.3 Requirements for Setting
25		the Message Integrity Fields” of [11].
26	Reserved	
27		The sender shall include reserved bits to make this
28		TLACEncapsulated1xL3PDU integral number of octets. The sender shall
		set all bits in this field to ‘0’.
29	1xL3PDULength	
30		The sender shall set this field to the length, in units of octets, of the
		1xL3PDU field.
31	1xL3PDU	
32		The sender shall set this field to the cdma2000 1x Layer 3 PDU; that is
33		associated with the GCSNAOption, followed by padding bits, all set to ‘0’,
34		to make this field octet aligned. cdma2000 1x Layer 3 messages for each
35		GCSNAOption are defined in [8]. The cdma200 1x Layer 3 message shall
36		be constructed according to [12], section 2.7 or 3.7.”

2.4.2 GCSNAL2Ack

The mobile station or the IWS sends a *GCSNAL2Ack* message to acknowledge the receipt of a *GCSNA1xCircuitService* message.

Field	Length (bits)
MessageID	8
AckSequence	6
Reserved	2

MessageID The sender shall set this field to 0x02.

AckSequence The sender shall set this field to the MessageSequence field of the *GCSNA1xCircuitService* message whose receipt is being acknowledged.

Reserved The sender shall set this field to '00'. The receiver shall ignore this field.

2.4.3 GCSNAServiceReject

The IWS sends a *GCSNAServiceReject* message to reject a *GCSNA1xCircuitService* message, *GCSNA1xParametersRequest* message, or a message with an invalid MessageID. The mobile station sends a *GCSNAServiceReject* message to reject a *GCSNA1xCircuitService* message, *GCSNA1xParameters* message, or a message with an invalid MessageID.

Field	Length (bits)
MessageID	8
RejectSequence	6
Cause	8
NUMFIELDS	0 or 8

NUMFIELDS occurrences of the following field:

{

GCSNAOption	0 or 8
RecordType	0 or 8

}

1xProtocolRevision	0 or 8
InvalidMessageID	0 or 8
Reserved	0 to 7 (as needed)

MessageID The sender shall set this field to 0x03.

RejectSequence If *GCSNA1xCircuitService* message, *GCSNA1xParametersRequest* message or *GCSNA1xParameters* message is being rejected, then the sender shall

1 set this field to the MessageSequence field of the rejected message. This
 2 field shall be set to '000000' if an unknown message is being rejected.

3 Cause The sender shall set the reason for rejection.

Cause	Value
Invalid GCSNAOption	00000000
Invalid 1xProtocolRevision	00000001
Invalid GCSNAOption and 1xProtocolRevision	00000010
InvalidMessageID	00000011
GCSNA1xParameters provisioning is not supported	00000100
UnSupported RecordType in GCSNA1xParameters message	00000101
Other values are reserved	-

4 NUMFIELDS If the Cause value is set to '00000000' or '00000010', the sender shall
 5 set this field to the number of GCSNAOptions that the sender supports;
 6 If the Cause value is set to '00000101', the sender shall set this field the
 7 number of RecordTypes that the sender supports. Otherwise, the sender
 8 shall omit this field.

9 GCSNAOption If the Cause value is set to '00000000' or '00000010', the sender shall
 10 set this field to the maximum GCSNAOption for each GCSNAClass that
 11 the sender supports; Otherwise the sender shall omit this field. The
 12 sender shall set this field as shown in Table 2.4.1-1.

13 RecordType If the Cause value is set to '00000101', the sender shall set this field to
 14 the RecordType in GCSNA1xParameters message that the sender
 15 supports. Otherwise, the sender shall omit this field.

16 1xProtocolRevision If the Cause value is set to '00000001' or '00000010', the sender shall
 17 set this field to the highest 1xProtocolRevision that the sender supports;
 18 Otherwise the sender shall omit this field.

19 InvalidMessageID If the Cause value is set to '00000011', the sender shall set this field the
 20 MessageID that the sender received. Otherwise, the sender shall omit
 21 this field.

22 Reserved The sender shall set all the bits of this field to '0' to make the entire
 23 message octet-aligned.

24 2.4.4 GCSNA1xParametersRequest

25 The mobile station sends a GCSNA1xParametersRequest message to obtain the set of 1x
 26 parameters.

1

Field	Length (bits)
MessageID	8
MessageSequence	6
Reserved	2

- 2 MessageID The mobile station shall set this field to 0x04.
- 3 MessageSequence The mobile station shall increment this value modulo 64 for each new
4 *GCSNA1xParametersRequest* message sent. If this is the first
5 *GCSNA1xParametersRequest* message sent by the mobile station, then
6 the mobile station shall set this field to zero.
- 7 Reserved The sender shall set this field to '00'. The receiver shall ignore this field.

8 2.4.5 GCSNA1xParameters

9 The IWS sends a *GCSNA1xParameters* message to provide values of parameters associated with
10 the cdma2000 1x circuit service to the mobile station.

11

12

Field	Length (bits)
MessageID	8
UnsolicitedMessage	1
MessageSequence	6
Reserved	1
Length	16
CDMA2000Parameters	(variable) Refer Section 3

- 13 MessageID This field is set to 0x05.
- 14 UnsolicitedMessage The IWS shall set this field to '0' if the *GCSNA1xParameters* message is
15 sent in response to *GCSNA1xParametersRequest* message. Otherwise,
16 the IWS shall set this field to '1'.
- 17 MessageSequence This field is set to the MessageSequence field of the
18 *GCSNA1xParametersRequest* message if the *GCSNA1xParameters*
19 message is sent in response to *GCSNA1xParametersRequest*. If the
20 *GCSNA1xParameters* message is initiated by the IWS, the IWS shall
21 increment this value modulo 64 for each new *GCSNA1xParameters*

1 message sent. If this is the first *GCSNA1xParameters* message sent by
2 the IWS, then this field is set to zero.

3 **Reserved** The sender shall set this field to '0'. The receiver shall ignore this field.

4 **Length** This field shall be set to the number of octets for the length of
5 *CDMA2000Parameters* field.

6 **CDMA2000Parameters**

7 Refer Section 3.

8 2.4.6 *GCSNA1xParametersAck*

9

Field	Length (bits)
MessageID	8
MessageSequence	6
Reserved	2

10 **MessageID** The mobile station shall set this field to 0x06.

11 **MessageSequence** The mobile station shall set this field to the *MessageSequence* field of the
12 *GCSNA1xParameters* message whose receipt is being acknowledged.

13 **Reserved** The sender shall set this field to '00'.

1

2 This page intentionally left blank.

3

4

3 CDMA2000PARAMETERS

This section defines the field of CDMA2000Parameters. Native 1x parameters (i.e. parameter defined in [12]) are marked with a “†” sign in the last column.

Field	Length (bits)	cdma2000 1x circuit service field
RecordType	8	
RecordValue	Variable	

RecordType This field shall be set to 0x00 for this version of CDMA2000Parameters. All other values are Reserved.

RecordValue If RecordType is set to 0x00, RecordValue fields shall be:

Field	Length (bits)	cdma2000 1x circuit service field
SIDIncluded	1	
SID	0 or 15	†
NIDIncluded	1	
NID	0 or 15	†
MULT_SIDSIncluded	1	
MULT_SIDS	0 or 1	†
MULT_NIDSIncluded	1	
MULT_NIDS	0 or 1	†
REG_ZONEIncluded	1	
REG_ZONE	0 or 12	†
TOTAL_ZONESIncluded	1	
TOTAL_ZONES	0 or 3	†
ZONE_TIMERIncluded	1	
ZONE_TIMER	0 or 3	†
PACKET_ZONE_IDIncluded	1	

PACKET_ZONE_ID	0 or 8	†
PZIDHystParametersIncluded	1	
PZ_HYST_ENABLED	0 or 1	†
PZ_HYST_INFO_INCL	0 or 1	†
PZ_HYST_LIST_LEN	0 or 1	†
PZ_HYST_ACT_TIMER	0 or 8	†
PZ_HYST_TIMER_MUL	0 or 3	†
PZ_HYST_TIMER_EXP	0 or 5	†
P_REVIncluded	1	
P_REV	0 or 8	†
MIN_P_REVIncluded	1	
MIN_P_REV	0 or 8	†
NEG_SLOT_CYCLE_INDEX_SUPIncluded	1	
NEG_SLOT_CYCLE_INDEX_SUP	0 or 1	†
ENCRYPT_MODEIncluded	1	
ENCRYPT_MODE	0 or 2	†
ENC_SUPPORTEDIncluded	1	
ENC_SUPPORTED	0 or 1	†
SIG_ENCRYPT_SUPIncluded	1	
SIG_ENCRYPT_SUP	0 or 8	†
MSG_INTEGRITY_SUPIncluded	1	
MSG_INTEGRITY_SUP	0 or 1	†
SIG_INTEGRITY_SUP_INCLIncluded	1	
SIG_INTEGRITY_SUP_INCL	0 or 1	†
SIG_INTEGRITY_SUPIncluded	1	
SIG_INTEGRITY_SUP	0 or 8	†
AUTHIncluded	1	
AUTH	0 or 2	†
MAX_NUM_ALT_SOIncluded	1	
MAX_NUM_ALT_SO	0 or 3	†
USE_SYNC_IDIncluded	1	
USE_SYNC_ID	0 or 1	†
MS_INIT_POS_LOC_SUP_INDIIncluded	1	

MS_INIT_POS_LOC_SUP_IND	0 or 1	†
MOB_QOSIncluded	1	
MOB_QOS	0 or 1	†
BAND_CLASS_INFO_REQIncluded	1	
BAND_CLASS_INFO_REQ	0 or 1	†
BAND_CLASSIncluded	1	
BAND_CLASS	0 or 5	†
BYPASS_REG_INDIncluded	1	
BYPASS_REG_IND	0 or 5	†
ALT_BAND_CLASSIncluded	1	
ALT_BAND_CLASS	0 or 5	†
MAX_ADD_SERV_INSTANCEIncluded	1	
MAX_ADD_SERV_INSTANCE	0 or 3	†
HOME_REGIncluded	1	
HOME_REG	0 or 1	†
FOR_SID_REGIncluded	1	
FOR_SID_REG	0 or 1	†
FOR_NID_REGIncluded	1	
FOR_NID_REG	0 or 1	†
POWER_UP_REGIncluded	1	
POWER_UP_REG	0 or 1	†
POWER_DOWN_REGIncluded	1	
POWER_DOWN_REG	0 or 1	†
PARAMETER_REGIncluded	1	
PARAMETER_REG	0 or 1	†
REG_PRDIncluded	1	
REG_PRD	0 or 7	†
REG_DISTIncluded	1	
REG_DIST	0 or 11	†
PREF_MSID_TYPEIncluded	1	
PREF_MSID_TYPE	0 or 2	†
EXT_PREF_MSID_TYPEIncluded	1	
EXT_PREF_MSID_TYPE	0 or 2	†
MEID_REQDIncluded	1	

MEID_REQD	0 or 1	†
MCCIncluded	1	
MCC	0 or 10	†
IMSI_11_12Included	1	
IMSI_11_12	0 or 7	†
IMSI_T_SUPPORTEDIncluded	1	
IMSI_T_SUPPORTED	0 or 1	†
RECONNECT_MSG_INDIncluded	1	
RECONNECT_MSG_IND	0 or 1	†
RER_MODE_SUPPORTEDInclude d	1	
RER_MODE_SUPPORTED	0 or 1	†
TKZ_MODE_SUPPORTEDIncluded	1	
TKZ_MODE_SUPPORTED	0 or 1	†
TKZ_IDIncluded	1	
TKZ_ID	0 or 1	†
PILOT_REPORTIncluded	1	
PILOT_REPORT	0 or 1	†
SDB_SUPPORTEDIncluded	1	
SDB_SUPPORTED	0 or 1	†
AUTO_FCSO_ALLOWEDIncluded	1	
AUTO_FCSO_ALLOWED	0 or 1	†
SDB_IN_RCNM_INDIncluded	1	
SDB_IN_RCNM_IND	0 or 1	†
FPC_FCH_Included	1	
FPC_FCH_INIT_SETPT_RC3	0 or 8	†
FPC_FCH_INIT_SETPT_RC4	0 or 8	†
FPC_FCH_INIT_SETPT_RC5	0 or 8	†
T_ADD_Included	1	
T_ADD	0 or 6	†
PILOT_INC_Included	1	
PILOT_INC	0 or 4	†
RAND_Included	1	
RAND	0 or 32	†
LP_SEC_Included	1	

LP_SEC	0 or 8	†
LTM_OFF_Included	1	
LTM_OFF	0 or 6	†
DAYLT_Included	1	
DAYLT	0 or 1	†
GCSNAL2AckTimer_Included	1	
GCSNAL2AckTimer	0 or 8	
GCSNASquenceContextTimer_Included	1	
GCSNASquenceContextTimer	0 or 8	
Reserved	0-7 (as needed)	

1	SIDIncluded	If SID is included in this message, then this field is set to '1'. Otherwise, this field is set to '0'.
2		
3	SID	If SIDIncluded is '0', then this field is omitted. Otherwise, this field is set according to the definition of the SID field as defined in [12].
4		
5	NIDIncluded	If NID is included in this message, then this field is set to '1'. Otherwise, this field is set to '0'.
6		
7	NID	If NIDIncluded is '0', then this field. Otherwise, this field is set according to the definition of the NID field as defined in [12].
8		
9	MULT_SIDSIncluded	If MULT_SIDS is included in this message, then this field is set to '1'. Otherwise, this field is set to '0'.
10		
11	MULT_SIDS	If MULT_SIDSIncluded is '0', then this field is omitted. Otherwise, this field is set according to the definition of the MULT_SIDS field as defined in [12].
12		
13		
14	MULT_NIDSIncluded	If MULT_NIDS is included in this message, then this field is set to '1'. Otherwise, this field is set to '0'.
15		
16	MULT_NIDS	If MULT_NIDSIncluded is '0', then this field is omitted. Otherwise, this field is set according to the definition of the MULT_NIDS field as defined in [12].
17		
18		
19	REG_ZONEIncluded	If REG_ZONE is included in this message, then this field is set to '1'. Otherwise, this field is set to '0'.
20		
21	REG_ZONE	If REG_ZONEIncluded is '0', this field is omitted. Otherwise, this field is set according to the definition of the REG_ZONE field as defined in [12].
22		

1	TOTAL_ZONESIncluded	
2		If TOTAL_ZONES is included in this message, then this field is set to '1'.
3		Otherwise, this field is set to '0'.
4	TOTAL_ZONES	If TOTAL_ZONESIncluded is '0', then this field is omitted. Otherwise, this
5		field is set according to the definition of the TOTAL_ZONES field as
6		defined in [12].
7	ZONE_TIMERIncluded	
8		If ZONE_TIMER is included in this message, then this field is set to '1'.
9		Otherwise, this field is set to '0'.
10	ZONE_TIMER	If ZONE_TIMERIncluded is '0', then this field is omitted. Otherwise, this
11		field is set according to the definition of the ZONE_TIMER field as defined
12		in [12].
13	PACKET_ZONE_IDIncluded	
14		If PACKET_ZONE_ID is included in this message, then this field is set to
15		'1'. Otherwise, this field is set to '0'.
16	PACKET_ZONE_ID	If PACKET_ZONE_IDIncluded is '0', then this field is omitted. Otherwise,
17		this field is set according to the definition of the PACKET_ZONE_ID field
18		of Extended System Parameters Message [12].
19	PZIDHystParametersIncluded	
20		If packet zone hysteresis parameters are included in this message, then
21		this field is set to '1'. Otherwise, this field is set to '0'.
22	PZ_HYST_ENABLED	If PZIDHystParametersIncluded is '0', or if PACKET_ZONE_ID is
23		'00000000', then this field is omitted. Otherwise, this field is set
24		according to the definition of the PZ_HYST_ENABLED field as defined in
25		[12].
26	PZ_HYST_INFO_INCL	
27		If PZIDHystParametersIncluded is '0', or if PZ_HYST_ENABLED is not
28		included or is included and set to '0', then this field is omitted.
29		Otherwise, this field is set according to the definition of the
30		PZ_HYST_INFO_INCL field as defined in [12].
31	PZ_HYST_LIST_LEN	If PZIDHystParametersIncluded is '0', or if PZ_HYST_INFO_INCL is not
32		included or is included and set to '0', then this field is omitted.
33		Otherwise, this field is set according to the definition of the
34		PZ_HYST_LIST_LEN field as defined in [12].

1	PZ_HYST_ACT_TIMER	
2		If PZIDHystParametersIncluded is '0', or if PZ_HYST_INFO_INCL is not
3		included or is included and set to '0', then this field is omitted.
4		Otherwise, this field is set according to the definition of the
5		PZ_HYST_ACT_TIMER field as defined in [12].
6	PZ_HYST_TIMER_MUL	
7		If PZIDHystParametersIncluded is '0', or if PZ_HYST_INFO_INCL is not
8		included or is included and set to '0', then this field is omitted.
9		Otherwise, this field is set according to the definition of the
10		PZ_HYST_TIMER_MUL field as defined in [12].
11	PZ_HYST_TIMER_EXP	
12		If PZIDHystParametersIncluded is '0', or if PZ_HYST_INFO_INCL is not
13		included or is included and set to '0', then this field is omitted.
14		Otherwise, this field is set according to the definition of the
15		PZ_HYST_TIMER_EXP field as defined in [12].
16	P_REVIncluded	If PREV is included in this message, then this field is set to '1'. Otherwise,
17		this field is set to '0'.
18	P_REV	If P_REVIncluded is '0', this field is omitted. Otherwise, this field is set
19		according to the definition of the PREV field as defined in [12].
20	MIN_P_REVIncluded	If MIN_P_REV is included in this message, then this field is set to '1'.
21		Otherwise, this field is set to '0'.
22	MIN_P_REV	If MIN_P_REVIncluded is '0', this field is omitted. Otherwise, this field is
23		set according to the definition of the MIN_P_REV field as defined in [12].
24	NEG_SLOT_CYCLE_INDEX_SUPIncluded	
25		If NEG_SLOT_CYCLE_INDEX_SUP is included in this message, then this
26		field is set to '1'. Otherwise, this field is set to '0'.
27	NEG_SLOT_CYCLE_INDEX_SUP	
28		If NEG_SLOT_CYCLE_INDEX_SUPIncluded is '0', this field is omitted.
29		Otherwise, this field is set according to the definition of the
30		NEG_SLOT_CYCLE_INDEX_SUP field as defined in [12].
31	ENCRYPT_MODEIncluded	
32		If ENCRYPT_MODE is included in this message, then this field is set to
33		'1'. Otherwise, this field is set to '0'.

1 ENCRYPT_MODE If ENCRYPT_MODEIncluded is '0', this field is omitted. Otherwise, this
2 field is set according to the definition of the ENCRYPT_MODE field as
3 defined in [12].

4 ENC_SUPPORTEDIncluded

5 If ENC_SUPPORTED is included in this message, then this field is set to
6 '1'. Otherwise, this field is set to '0'.

7 ENC_SUPPORTED If ENC_SUPPORTEDIncluded is '0', this field is omitted. Otherwise, this
8 field is set according to the definition of the ENC_SUPPORTED field as
9 defined in [12].

10 SIG_ENCRYPT_SUPIncluded

11 If SIG_ENCRYPT_SUP is included in this message, then this field is set to
12 '1'. Otherwise, this field is set to '0'.

13 SIG_ENCRYPT_SUP If SIG_ENCRYPT_SUPIncluded is '0', this field is omitted. Otherwise, this
14 field is set according to the definition of the SIG_ENCRYPT_SUP field as
15 defined in [12].

16 MSG_INTEGRITY_SUPIncluded

17 If MSG_INTEGRITY_SUP is included in this message, then this field is set
18 to '1'. Otherwise, this field is set to '0'.

19 MSG_INTEGRITY_SUP

20 If MSG_INTEGRITY_SUPIncluded is '0', this field is omitted. Otherwise,
21 this field is set according to the definition of the MSG_INTEGRITY_SUP
22 field as defined in [12].

23 SIG_INTEGRITY_SUP_INCLIncluded

24 If SIG_INTEGRITY_SUP_INCL is included in this message, then this field
25 is set to '1'. Otherwise, this field is set to '0'.

26 SIG_INTEGRITY_SUP_INCL

27 If SIG_INTEGRITY_SUP_INCLIncluded is '0', this field is omitted.
28 Otherwise, this field is set according to the definition of the
29 SIG_INTEGRITY_SUP_INCL field as defined in [12].

30 SIG_INTEGRITY_SUPIncluded

31 If SIG_INTEGRITY_SUP is included in this message, then this field is set
32 to '1'. Otherwise, this field is set to '0'.

1	SIG_INTEGRITY_SUP	
2		If SIG_INTEGRITY_SUPIncluded is '0', this field is omitted. Otherwise,
3		this field is set according to the definition of the SIG_INTEGRITY_SUP
4		field as defined in [12].
5	AUTHIncluded	If AUTH is included in this message, then this field is set to '1'.
6		Otherwise, this field is set to '0'.
7	AUTH	If AUTHIncluded is '0', this field is omitted. Otherwise, this field is set
8		according to the definition of the AUTH field as defined in [12].
9	MAX_NUM_ALT_SOIncluded	
10		If MAX_NUM_ALT_SO is included in this message, then this field is set to
11		'1'. Otherwise, this field is set to '0'.
12	MAX_NUM_ALT_SO	If MAX_NUM_ALT_SOIncluded is '0', this field is omitted . Otherwise, this
13		field is set according to the definition of the MAX_NUM_ALT_SO field as
14		defined in [12].
15	USE_SYNC_IDIncluded	
16		If USE_SYNC_ID is included in this message, then this field is set to '1'.
17		Otherwise, this field is set to '0'.
18	USE_SYNC_ID	If USE_SYNC_IDIncluded is '0', this field is omitted . Otherwise, this field
19		is set according to the definition of the USE_SYNC_ID field as defined in
20		[12].
21	MS_INIT_POS_LOC_SUP_INDIncluded	
22		If MS_INIT_POS_LOC_SUP_IND is included in this message, then this
23		field is set to '1'. Otherwise, this field is set to '0'.
24	MS_INIT_POS_LOC_SUP_IND	
25		If MS_INIT_POS_LOC_SUP_INDIncluded is '0', this field is omitted .
26		Otherwise, this field is set according to the definition of the
27		MS_INIT_POS_LOC_SUP_IND field as defined in [12].
28	MOB_QOSIncluded	If MOB_QOS is included in this message, then this field is set to '1'.
29		Otherwise, this field is set to '0'.
30	MOB_QOS	If MOB_QOSIncluded is '0', this field is omitted . Otherwise, this field is
31		set according to the definition of the MOB_QOS field as defined in [12].
32	BAND_CLASS_INFO_REQIncluded	

1 If BAND_CLASS_INFO_REQ is included in this message, then this field is
2 set to '1'. Otherwise, this field is set to '0'.

3 BAND_CLASS_INFO_REQ

4 If BAND_CLASS_INFO_REQIncluded is '0', this field is omitted .
5 Otherwise, this field is set according to the definition of the
6 BAND_CLASS_INFO_REQ field as defined in [12].

7 BAND_CLASSIncluded

8 If BAND_CLASS is included in this message, then this field is set to '1'.
9 Otherwise, this field is set to '0'.

10 BAND_CLASS If BAND_CLASSIncluded is '0', then this field is omitted. Otherwise, this
11 field is set according to the definition of the BAND_CLASS as defined in
12 [14].

13 BYPASS_REG_INDIncluded

14 If BYPASS_REG_IND is included in this message, then this field is set to
15 '1'. Otherwise, this field is set to '0'.

16 BYPASS_REG_IND

17 If BYPASS_REG_INDIncluded is '0', then this field is omitted. Otherwise,
18 this field is set according to the definition of the BYPASS_REG_IND as
19 defined in [12].

20 ALT_BAND_CLASSIncluded

21 If ALT_BAND_CLASS is included in this message, then this field is set to
22 '1'. Otherwise, this field is set to '0'.

23 ALT_BAND_CLASS If ALT_BAND_CLASSIncluded is '0', this field is omitted . Otherwise, this
24 field is set according to the definition of the ALT_BAND_CLASS field as
25 defined in [12].

26 MAX_ADD_SERV_INSTANCEIncluded

27 If MAX_ADD_SERV_INSTANCE is included in this message, then this
28 field is set to '1'. Otherwise, this field is set to '0'.

29 MAX_ADD_SERV_INSTANCE

30 If MAX_ADD_SERV_INSTANCEIncluded is '0', this field is omitted .
31 Otherwise, this field is set according to the definition of the
32 MAX_ADD_SERV_INSTANCE field as defined in [12].

1	HOME_REGIncluded	If HOME_REG is included in this message, then this field is set to '1'.
2		Otherwise, this field is set to '0'.
3	HOME_REG	If HOME_REGIncluded is '0', this field is omitted . Otherwise, this field is
4		set according to the definition of the HOME_REG field as defined in [12].
5	FOR_SID_REGIncluded	
6		If FOR_SID_REG is included in this message, then this field is set to '1'.
7		Otherwise, this field is set to '0'.
8	FOR_SID_REG	If FOR_SID_REGIncluded is '0', this field is omitted . Otherwise, this field
9		is set according to the definition of the FOR_SID_REG field as defined in
10		[12].
11	FOR_NID_REGIncluded	
12		If FOR_NID_REG is included in this message, then this field is set to '1'.
13		Otherwise, this field is set to '0'.
14	FOR_NID_REG	If FOR_NID_REGIncluded is '0', this field is omitted . Otherwise, this field
15		is set according to the definition of the FOR_NID_REG field as defined in
16		[12].
17	POWER_UP_REGIncluded	
18		If POWER_UP_REG is included in this message, then this field is set to
19		'1'. Otherwise, this field is set to '0'.
20	POWER_UP_REG	If POWER_UP_REGIncluded is '0', this field is omitted . Otherwise, this
21		field is set according to the definition of the POWER_UP_REG field as
22		defined in [12].
23	POWER_DOWN_REGIncluded	
24		If POWER_DOWN_REG is included in this message, then this field is set
25		to '1'. Otherwise, this field is set to '0'.
26	POWER_DOWN_REG	
27		If POWER_DOWN_REGIncluded is '0', this field is omitted . Otherwise,
28		this field is set according to the definition of the POWER_DOWN_REG
29		field as defined in [12].
30	PARAMETER_REGIncluded	
31		If PARAMETER_REG is included in this message, then this field is set to
32		'1'. Otherwise, this field is set to '0'.

1	PARAMETER_REG	If PARAMETER_REGIncluded is '0', this field is omitted . Otherwise, this
2		field is set according to the definition of the PARAMETER_REG field as
3		defined in [12].
4	REG_PRDIncluded	If REG_PRD is included in this message, then this field is set to '1'.
5		Otherwise, this field is set to '0'.
6	REG_PRD	If REG_PRDIncluded is '0', this field is omitted . Otherwise, this field is
7		set according to the definition of the REG_PRD field as defined in [12].
8	REG_DISTIncluded	If REG_DIST is included in this message, then this field is set to '1'.
9		Otherwise, this field is set to '0'.
10	REG_DIST	If REG_DISTIncluded is '0', this field is omitted . Otherwise, this field is
11		set according to the definition of the REG_DIST field as defined in [12].
12	PREF_MSID_TYPEIncluded	
13		If PREF_MSID_TYPE is included in this message, then this field is set to
14		'1'. Otherwise, this field is set to '0'.
15	PREF_MSID_TYPE	If PREF_MSID_TYPEIncluded is '0', this field is omitted . Otherwise, this
16		field is set according to the definition of the PREF_MSID_TYPE field as
17		defined in [12].
18	EXT_PREF_MSID_TYPEIncluded	
19		If EXT_PREF_MSID_TYPE is included in this message, then this field is
20		set to '1'. Otherwise, this field is set to '0'.
21	EXT_PREF_MSID_TYPE	
22		If EXT_PREF_MSID_TYPEIncluded is '0', this field is omitted . Otherwise,
23		this field is set according to the definition of the EXT_PREF_MSID_TYPE
24		field as defined in [12].
25	MEID_REQDIncluded	If MEID_REQD is included in this message, then this field is set to '1'.
26		Otherwise, this field is set to '0'.
27	MEID_REQD	If MEID_REQDIncluded is '0', this field is omitted . Otherwise, this field
28		is set according to the definition of the MEID_REQD field as defined in
29		[12].
30	MCCIncluded	If MCC is included in this message, then this field is set to '1'. Otherwise,
31		this field is set to '0'.
32	MCC	If MCCIncluded is '0', this field is omitted . Otherwise, this field is set
33		according to the definition of the MCC field as defined in [12].

1 IMSI_11_12Included If IMSI_11_12 is included in this message, then this field is set to '1'.
2 Otherwise, this field is set to '0'.

3 IMSI_11_12 If IMSI_11_12Included is '0', this field is omitted . Otherwise, this field is
4 set according to the definition of the IMSI_11_12 field as defined in [12].

5 IMSI_T_SUPPORTEDIncluded

6 If IMSI_T_SUPPORTED is included in this message, then this field is set
7 to '1'. Otherwise, this field is set to '0'.

8 IMSI_T_SUPPORTED If IMSI_T_SUPPORTEDIncluded is '0', this field is omitted . Otherwise,
9 this field is set according to the definition of the IMSI_T_SUPPORTED
10 field as defined in [12].

11 RECONNECT_MSG_INDIncluded

12 If RECONNECT_MSG_IND is included in this message, then this field is
13 set to '1'. Otherwise, this field is set to '0'.

14 RECONNECT_MSG_IND

15 If RECONNECT_MSG_INDIncluded is '0', this field is omitted . Otherwise,
16 this field is set according to the definition of the RECONNECT_MSG_IND
17 field as defined in [12].

18 RER_MODE_SUPPORTEDIncluded

19 If RER_MODE_SUPPORTED is included in this message, then this field is
20 set to '1'. Otherwise, this field is set to '0'.

21 RER_MODE_SUPPORTED

22 If RER_MODE_SUPPORTEDIncluded is '0', this field is omitted .
23 Otherwise, this field is set according to the definition of the
24 RER_MODE_SUPPORTED field as defined in[12].

25 TKZ_MODE_SUPPORTEDIncluded

26 If TKZ_MODE_SUPPORTED is included in this message, then this field is
27 set to '1'. Otherwise, this field is set to '0'.

28 TKZ_MODE_SUPPORTED

29 If TKZ_MODE_SUPPORTEDIncluded is '0', this field is omitted .
30 Otherwise, this field is set according to the definition of the
31 TKZ_MODE_SUPPORTED field as defined in [12].

1	TKZ_IDIncluded	If TKZ_ID is included in this message, then this field is set to '1'.
2		Otherwise, this field is set to '0'.
3	TKZ_ID	If TKZ_IDIncluded is '0', this field is omitted . Otherwise, this field is set
4		according to the definition of the TKZ_ID field as defined in [12].
5	PILOT_REPORTIncluded	
6		If PILOT_REPORT is included in this message, then this field is set to '1'.
7		Otherwise, this field is set to '0'.
8	PILOT_REPORT	If PILOT_REPORTIncluded is '0', this field is omitted . Otherwise, this
9		field is set according to the definition of the PILOT_REPORT field as
10		defined in [12].
11	SDB_SUPPORTEDIncluded	
12		If SDB_SUPPORTED is included in this message, then this field is set to
13		'1'. Otherwise, this field is set to '0'.
14	SDB_SUPPORTED	If SDB_SUPPORTEDIncluded is '0', this field is omitted . Otherwise, this
15		field is set according to the definition of the SDB_SUPPORTED field as
16		defined in [12].
17	AUTO_FCSO_ALLOWEDIncluded	
18		If AUTO_FCSO_ALLOWED is included in this message, then this field is
19		set to '1'. Otherwise, this field is set to '0'.
20	AUTO_FCSO_ALLOWED	
21		If AUTO_FCSO_ALLOWEDIncluded is '0', this field is omitted . Otherwise,
22		this field is set according to the definition of the AUTO_FCSO_ALLOWED
23		field as defined in [12].
24	SDB_IN_RCNM_INDIncluded	
25		If SDB_IN_RCNM_IND is included in this message, then this field is set
26		to '1'. Otherwise, this field is set to '0'.
27	SDB_IN_RCNM_IND	If SDB_IN_RCNM_INDIncluded is '0', this field is omitted . Otherwise,
28		this field is set according to the definition of the SDB_IN_RCNM_IND field
29		as defined in [12].
30	FPC_FCH_Included	If FPC_FCH_INIT_SETPT is included in this message, then this field is set
31		to '1'. Otherwise, this field is set to '0'.
32	FPC_FCH_INIT_SETPT_RC3	

1		If FPC_FCH_Included is '0', this field is omitted . Otherwise, this field is
2		set according to the definition of the FPC_FCH_INIT_SETPT field as
3		defined in [12] for use with RC3.
4	FPC_FCH_INIT_SETPT_RC4	
5		If FPC_FCH_Included is '0', this field is omitted . Otherwise, this field is
6		set according to the definition of the FPC_FCH_INIT_SETPT field as
7		defined in[12] for use with RC4.
8	FPC_FCH_INIT_SETPT_RC5	
9		If FPC_FCH_Included is '0', this field is omitted . Otherwise, this field is
10		set according to the definition of the FPC_FCH_INIT_SETPT field as
11		defined in [12] for use with RC5.
12	T_ADD_Included	If T_ADD is included in this message, then this field is set to '1'.
13		Otherwise, this field is set to '0'.
14	T_ADD	If T_ADD_Included is '0', this field is omitted . Otherwise, this field is set
15		according to the definition of the T_ADD field as defined in [12].
16	PILOT_INC_Included	If PILOT_INC is included in this message, then this field is set to '1'.
17		Otherwise, this field is set to '0'.
18	PILOT_INC	If PILOT_INC_Included is '0', this field is omitted . Otherwise, this field is
19		set according to the definition of the PILOT_INC field as defined in [12].
20	RAND_Included	If RAND is included in this message, then this field is set to '1'.
21		Otherwise, this field is set to '0'.
22	RAND	If RAND_Included is '0', this field is omitted. Otherwise, this field is set
23		according to the definition of the RAND field as defined in [12].
24	LP_SEC_Included	If LP_SEC is included in this message, then this field is set to '1'.
25		Otherwise, this field is set to '0'.
26	LP_SEC	If LP_SEC_Included is '0', this field is omitted. Otherwise, this field is
27		included and set according to the definition of the LP_SEC field as
28		defined in [12].
29	LTM_OFF_Included	If LTM_OFF is included in this message, then this field is set to '1'.
30		Otherwise, this field is set to '0'.
31	LTM_OFF	If LTM_OFF_Included is '0', this field is omitted. Otherwise, this field is
32		included and set according to the definition of the LTM_OFF field as
33		defined in [12].

1	DAYLT_Included	If DAYLT is included in this message, then this field is set to '1'.
2		Otherwise, this field is set to '0'.
3	DAYLT	If DAYLT_Included is '0', this field is omitted. Otherwise, this field is
4		included and set according to the definition of the DAYLT field as defined
5		in [12].
6	GCSNAL2AckTimer_Included	
7		If the IWS is configured to use GCSNA L2 ack, this field is set to '1'.
8		Otherwise, this field shall be set to '0'.
9	GCSNAL2AckTimer	If GCSNAL2AckTimer_Included is '0', this field is omitted . Otherwise,
10		this field is set to the length of time the mobile station or IWS is to wait
11		after it sends <i>GCSNA1xCircuitService</i> message with the AckRequired bit
12		set to '1', in units of 80 ms.
13	GCSNASEquenceContextTimer_Included	
14		If GCSNASEquenceContextTimer is included in this message, then this
15		field is set to '1'. Otherwise, this field shall be set to '0'.
16	GCSNASEquenceContextTimer	
17		If GCSNASEquenceContextTimer_Included is set to '0', this field is
18		omitted. Otherwise, this field is set to GCSNASEquenceContextTimer
19		value. This field is in units of 100 ms.
20	Reserved	The reserved bits are added to make the length of the entire message an
21		integer number of octets. These bits are set to zero. The receiver ignores
22		these bits.
23		

4 E-UTRAN AND 1X INTERWORKING

4.1 GCSNA1xParameters Requirement for Interworking with E-UTRAN

PREF_MSID_TYPE and IMSI_T_SUPPORTED fields shall be included in CDMA2000Parameters. The PREF_MSID_TYPEIncluded and IMSI_T_SUPPORTEDIncluded fields shall be set to '1'.

If the P_REV value is greater than ten, the EXT_PREF_MSID_TYPEIncluded field shall also be set to '1'. If EXT_PREF_MSID_TYPE is set to '11' and PREF_MSID_TYPE is set to '00' or '11', the MEID_REQDIncluded shall be set to '0', otherwise, the MEID_REQDIncluded shall be set to '1'.

E-UTRAN broadcasts some 1x parameters in SIB8 (System Information Block 8) [4]. If the 1x parameters in SIB8 are duplicated in CDMA2000 Parameters defined in section 3, and the mobile station receives those duplicated parameters from both CDMA2000 Parameters and SIB8, the parameters that are received and stored later take precedence.

The GCSNA layer in the mobile station shall not send the *GCSNA1xParametersRequest* message over the tunnel. The IWS shall not send the *GCSNA1xParameters* message over the tunnel. 1x parameters provisioning is defined in [4].

The mobile station shall not set the AckRequired field to '1' in the *GCSNA1xCircuitService* message when it sends the *Origination* message or *Page Response* message as E-UTRAN RRC does not provide a mechanism to retransmit those 1x messages. The mobile station may set AckRequired field to '1' in the *GCSNA1xCircuitService* when it sends any other 1x messages.

4.2 MobilityParametersCDMA2000 definition for E-UTRAN

The CDMA2000Parameters field defined in section 3 shall be used as MobilityParametersCDMA2000 information element defined in [4]. GCSNAL2AckTimer_Included and GCSNASEquenceContextTimer_Included in the CDMA2000Parameters field shall be set to '1'.

The MobilityParametersCDMA2000 information element is included in *CSFBParametersResponseCDMA2000* message or *HandoverFromE-UTRAPreparationRequest* message defined in [4].

4.3 Requirements for Transmission and Reception of 1x messages

The cdma2000 upper layer in the mobile station and the IWS shall use *GCSNA1xCircuitService* message to exchange 1x Layer 3 PDUs.

When TLACEncapsulated1xL3PDU contains *General Page* Message, the SERVICE_OPTION field in the 1x L3 PDU can be omitted by setting 1xL3PDULength to zero.

Receiver shall ignore TLACHeaderRecord that it does not support.

4.4 Notification to cdma2000 1x Base Station

If the mobile station detects a trigger for power up registration, such as Band Class change, as defined in [12], the mobile station shall perform a power up registration if the POWER_UP_REG is set to '1' in the 1x overhead message, CDMA2000PARAMETERS, or SIB8. Band Class

1 information is provided by *CDMA2000Parameters*. The mobile station shall use the Band Class
 2 information provided by *CDMA2000Parameters* message for power up registration related
 3 procedure only.

4 **4.5 E-UTRAN Neighbor Record Processing for 1x**

5 4.5.1 E-UTRAN Neighbor Channels Management and E-UTRAN Idle Channel Reselection 6 Procedures

7 This section provides the procedures used by the mobile station to process received “E-UTRAN
 8 Neighbor List Record”, and the requirements to perform idle E-UTRAN frequency channel
 9 reselection. The mobile station uses the information received from *Alternative Technologies*
 10 *Information* message as specified in [12] as radio interface type-specific fields to perform E-
 11 UTRAN frequency channel measurements⁴.

12 4.5.1.1 E-UTRAN Neighbor List Management and E-UTRAN Frequency Channel Measurement

13 If *Alternative Technologies Information* message is received, the mobile station shall perform the
 14 following in the order specified:

- 15 • The mobile station shall delete the existing E-UTRAN neighbor cell list constructed based
 16 on the E-UTRAN neighbor cell list specified in [4] and [2] and the information provided by
 17 previously received *Alternative Technologies Information* message.
- 18 • If PLMNID is included in the *Alternative Technologies Information* message, the mobile
 19 station shall remove the E-UTRAN Frequency Channels associates with the PLMNID not
 20 selected by the mobile station from the E-UTRAN frequency channel list included in the
 21 *Alternative Technologies Information* message.
- 22 • The mobile station shall construct E-UTRAN neighbor cell list based on the E-UTRAN
 23 neighbor cell list specified in [4] and [2] and the information provided by the latest
 24 *Alternative Technologies Information* message received.

25 If the mobile station has determined to perform E-UTRAN neighbor channel measurement, the
 26 mobile station shall perform E-UTRAN neighbor cell measurements according to the
 27 procedures and rules specified in [2] and [3].

28 If none of the E-UTRAN frequency channels met the reselection criteria, then

- 29 • If the mobile station received the *Alternative Technologies Information* message with the
 30 *MinMeasurementBackoff* and *MaxMeasurementBackoff* fields included, the mobile
 31 station should retry the measurement procedures T seconds after the mobile station
 32 determined the failure, where the T should meet: $2^{\text{MinMeasurementBackoff}} \leq T \leq$
 33 $2^{\text{MaxMeasurementBackoff}}$ seconds.
- 34 • Otherwise, the mobile station may retry the measurement procedures after an
 35 implementation specific time period.

⁴ Although the *Alternative Technologies Information* message and the associated *System Parameters* message enhancement are specified in [12], the feature can be supported by base-stations supporting any earlier P_REV enhanced for interworking with E-UTRAN.

4.5.1.2 E-UTRAN Cell Reselection Procedures in the Idle State

When the mobile station is in the Idle State, the mobile station uses E-UTRAN signal quality threshold, serving sector threshold trigger point and other criteria specified in this section and criteria outside the scope of this specification to decide whether the mobile station perform idle reselection to the qualified E-UTRAN neighbor channel.

If a mobile station receives an *Alternative Technologies Information* message and decides to perform the reselection procedures, the mobile station in the Idle State shall perform E-UTRAN frequency channel reselection procedures according to the rules specified as follows:

- If the *ServingPriority* and *EARFCNPriority* fields are included in the *Alternative Technologies Information* message, and if the mobile station is required to give precedence to the *ServingPriority* and *EARFCNPriority* set by the serving network based on the operator's policy, the mobile station shall perform priority based reselection procedures defined by the current serving base station as follows:
 - The mobile station shall sort the E-UTRAN frequency channels in the order of *EARFCNPriority* from highest priority to the lowest priority.
 - The mobile station shall switch to the first E-UTRAN frequency channel in the sorted list that meets all of the following criteria:
 - + One of the following conditions are met
 - *EARFCNPriority* of the E-UTRAN frequency channel is greater than the *Serving Priority*, or
 - *EARFCNPriority* of the E-UTRAN frequency channel is less than or equal to the *Serving Priority* and the strength of the reference pilot of the serving 1x network is less than the *ThreshServing*.
 - + The *Srxlev-value*⁵ of the associated E-UTRAN frequency channel is equal to or greater than its corresponding *ThreshX* value.
 - + The *EUTRAREselectTimer* is started with a value that is set as described in section 4.5.1.2.1.
 - + Upon the expiry of the *EUTRAREselectTimer*, the *Srxlev-value* of the associated E-UTRAN frequency channel is equal to or greater than its corresponding *ThreshX*.
- Otherwise, if the mobile station has determined to switch to an E-UTRAN frequency channel, then the mobile station shall perform the following procedure:
 - The mobile station shall switch to an E-UTRAN frequency channel that meets all of the following criteria:
 - + The *Srxlev-value* of the associated E-UTRAN frequency channel is equal to or greater than its corresponding *ThreshX*.

⁵ *Srxlev* is defined in [3].

- 1 + The EUTRAREselectTimer is started with a value that is set as described in section
2 4.5.1.2.1.
- 3 + Upon the expiry of the EUTRAREselectTimer, the Srxlev-value of the associated E-
4 UTRAN frequency channel is equal to or greater than its corresponding ThreshX.

5 4.5.1.2.1 EUTRAREselectTimer value

6 The mobile station shall select the value of the EUTRAREselectTimer as follows:

- 7 • If MaxReselectionTimer is not included, the mobile station shall set the value of
8 EUTRAREselectTimer to an implementation specific duration of time.
- 9 • Otherwise, the mobile station shall set the value of EUTRAREselectTimer to a uniformly
10 distributed random value between 0 to $2^{\text{MaxReselectionTimer}}$ seconds.

11 4.5.2 E-UTRAN neighbor records format

12 This section contains other RAT neighbor records format associates with *Alternative*
13 *Technologies Information* message specified in [12].

14 In this section, the base station means the base station for cdma2000 1x.

15 4.5.2.1 E-UTRAN Neighbor List Record

16

Field	Length (bits)
PriorityIncluded	1
ServingPriority	0 or 3
ThreshServing	6
PerEARFCNParamsIncluded	1
RxLevMinEUTRACommon	0 or 7
PEMaxCommon	0 or 6
RxLevMinEUTRAOffsetCommonIncl	0 or 1
RxLevMinEUTRAOffsetCommon	0 or 3
MaxReselectionTimerIncluded	1
MaxReselectionTimer	0 or 4
SearchBackOffTimerIncluded	1
MinMeasurementBackoff	0 or 4
MaxMeasurementBackoff	0 or 4
PLMNIDIncluded	1
NumEUTRAFrequencies	3

NumEUTRAFrequencies occurrences of the following record:
{0

EARFCN	16
EARFCNPriority	0 or 3
ThreshX	5
RxLevMinEUTRA	0 or 7
PEMax	0 or 6
RxLevMinEUTRAOffset Incl	0 or 1
RxLevMinEUTRAOffset	0 or 3
MeasurementBandwidth	3
PLMNSameAsPreviousChannel	0 or 1
NumPLMNIDs	0 or 3

If NumPLMNIDs field is included, the NumPLMNIDs+1 occurrences of the following record; Otherwise, 0 occurrences of the following record.

```
{1
```

PLMNID	24
--------	----

```
}1  
}0
```

Reserved0	0-7 (as needed)
-----------	-----------------

- 1 **PriorityIncluded** If the base station includes priority and priority related fields in this
- 2 then the base station shall set this field to '1'. Otherwise the base
- 3 station shall set this field to '0'.

- 4 **ServingPriority** If the PriorityIncluded is set to '0', then the base station shall omit this
- 5 field. Otherwise, the base station shall set this field to the value of the
- 6 priority which is used by the mobile station as the priority of its current
- 7 serving CDMA channel.

- 8 **ThreshServing** Serving threshold trigger point for E-UTRAN neighbor selection associate
- 9 with ThreshX.

- 10 The base station shall set this field to $\lfloor -2 \times 10 \times \log_{10} PS \rfloor$, where PS is
- 11 the strength of the reference pilot of the serving Base station, measured
- 12 as specified in [12].

- 13 **PerEARFCNParamsIncluded**

- 14 If the base station includes RxLevMinEUTRA for each of the EARFCN,
- 15 then the base station shall set this field to '1'. Otherwise the base station
- 16 shall set this field to '0'.

1 RxLevMinEUTRACommon

2 Minimum received RSRP level from the EUTRA cell. It is a common value
3 for all the neighboring EUTRA frequencies.

4 If the PerEARFCNParamsIncluded is set to '1', then the base station shall
5 omit this field. Otherwise, the base station shall set this field in the
6 range 0 to 96, where $-44 - \text{RxLevMinEUTRACommon}$ in dBm is equal to
7 the minimum reference signal received power (RSRP) level of a EUTRA
8 cell as specified in [3]

9 PEMaxCommon Maximum TX power level an UE may use when transmitting on the
10 uplink in E-UTRA.

11 If the PerEARFCNParamsIncluded is set to '1', then the base station shall
12 omit this field. Otherwise, the base station shall set this field to the
13 maximum TX power level an UE may use when transmitting on the
14 uplink in the cell (dBm) as defined in [3].

15 RxLevMinEUTRAOffsetCommonIncl

16 Offset to Minimum reference power level to select EUTRA Included.

17 If the PerEARFCNParamsIncluded is set to '1', then the base station shall
18 omit this field. Otherwise, if the base station includes
19 RxLevMinEUTRAOffsetCommon in this record, then the base station
20 shall set this field to '1'.

21 RxLevMinEUTRAOffsetCommon

22 Offset to Minimum reference power level to select EUTRA. It is a common
23 value for all the neighboring EUTRA frequencies.

24 If the RxLevMinEUTRAOffsetCommonIncl is set to '0', then the base
25 station shall omit this field. Otherwise, the base station shall set this
26 field to one less than the value specified in [3]. The range of values
27 allowed is 1 through 8.

28 MaxReselectionTimerIncluded Maximum value of Reselection Timer Included

29 If the base station includes Reselection Timer value in this record, then
30 the base station shall set this field to '1'. Otherwise the base station shall
31 set this field to '0'.

32 MaxReselectionTimer The maximum value of the Reselection Timer

33 If the MaxReselectionTimerIncluded is set to '0', then the base station
34 shall omit this field. Otherwise, the base station shall set this field such
35 that the upper limit of the random reselection timer that the mobile
36 station selects is set to $2^{\text{MaxReselectionTimer}}$ seconds.

1		Note: The mobile station will start a reselection timer, which is set to a
2		random value with an upper limit set to $2^{\text{MaxReselectionTimer}}$ seconds when
3		the mobile station determines that the other conditions to perform a
4		reselection from 1x to E-UTRAN are met.
5	SearchBackOffTimerIncluded	Search Back-off Timer Included
6		If the base station includes the value for Search Back-off Timer in this
7		message, then the base station shall set this field to '1'. Otherwise the
8		base station shall set this field to '0'.
9	MinMeasurementBackoff	Minimum value of the measurement Back-off Timer
10		If the SearchBackOffTimerIncluded is set to '0', then the base station
11		shall omit this field. Otherwise, the base station shall set this field such
12		that the lower limit of the backoff timer that the mobile station should
13		select is set to $2^{\text{MinMeasurementBackoff}}$ seconds.
14	MaxMeasurementBackoff	Maximum value of the measurement Back-off Timer
15		If the SearchBackOffTimerIncluded is set to '0', then the base station
16		shall omit this field. Otherwise, the base station shall set this field such
17		that the upper limit of the backoff timer that the mobile station should
18		select is set to $2^{\text{MaxMeasurementBackoff}}$ seconds.
19	PLMNIDIncluded	PLMN Identifier Included.
20		If the base station includes PLMN Identifier values in this record, then
21		the base station shall set this field to '1'. Otherwise the base station shall
22		set this field to '0'.
23	NumEUTRAFrequencies	
24		The base station shall set this field to the number of EUTRA frequencies
25		included in this record.
26	EARFCN	EUTRA Absolute Radio Frequency Channel Number.
27		The base station shall set this field to the EARFCN of the neighbor
28		EUTRA system as defined in [4].
29	EARFCNPriority	Priority of the EARFCN of the neighboring EUTRA system
30		If the PriorityIncluded is set to '0', then the base station shall omit this
31		field. Otherwise, the base station shall set this field to the priority of the
32		EARFCN of the neighbor EUTRA system as the cell reselection priority
33		defined in [4].
34	ThreshX	Minimum required signal quality threshold used for selecting an
35		EARFCN
36		The base station shall set this field in the range 0 to 31. The actual
37		threshold value in dB used to compare against the measured reference
38		signal receive power (RSRP) is equal to $\text{ThreshX} * 2$ as specified in [3].

1	RxLevMinEUTRA	Minimum received RSRP level from the EUTRA cell
2		If the PerEARFCNParamsIncluded is set to '0', then the base station shall
3		omit this field. Otherwise, the base station shall set this field in the
4		range 0 to 96, where $-44 - RxLevMinEUTRA$ in dBm is equal to the
5		minimum reference signal received power (RSRP) level of a EUTRA cell
6		required for the UE to reselect EUTRA, as specified in [3].
7	PEMax	Maximum TX power level an UE may use when transmitting on the
8		uplink in E-UTRA.
9		If the PerEARFCNParamsIncluded is set to '0', then the base station shall
10		omit this field. Otherwise, the base station shall set this field to the
11		maximum TX power level an UE may use when transmitting on the
12		uplink in the cell (dBm) as defined in [3].
13	RxLevMinEUTRAOffsetIncl	
14		Offset to Minimum reference power level to select EUTRA Included.
15		If the PerEARFCNParamsIncluded is set to '0', then the base station shall
16		omit this field. Otherwise, if the base station includes
17		RxLevMinEUTRAOffset in this record, then the base station shall set this
18		field to '1'.
19	RxLevMinEUTRAOffset	
20		Offset to Minimum reference power level to select EUTRA.
21		If the RxLevMinEUTRAOffsetIncl is set to '0', then the base station shall
22		omit this field. Otherwise, the base station shall set this field to one less
23		than the value specified in [3]. The range of values allowed is 1 through
24		8.
25	MeasurementBandwidth	
26		Measurement bandwidth information is common for all neighboring cells
27		on the carrier frequency. It is defined by the parameter Transmission
28		Bandwidth Configuration, N_{RB} [3]. The values indicate the number of
29		resource blocks over which the UE could measure.
30		The base station shall set this field to the binary value corresponding to
31		the transmission bandwidth configuration, N_{RB} , value in Table 4.5.2-1.

Table 4.5.2-1 Measurement Bandwidth

Field value (binary)	Transmission bandwidth configuration N_{RB}
'000'	6
'001'	15
'010'	25
'011'	50
'100'	75
'101'	100
'110' ~ '111'	Reserved

PLMNSameAsPreviousChannel

PLMN ID of this channel is same as the previous EARFCN

If the PLMNIDIncluded is set to '0', then the base station shall omit this field. Otherwise, if the number of PLMNIDs of this EARFCN is same as the previous EARFCN, and all the PLMNIDs of this EARFCN are identical to the previous EARFCN, then the base station shall set this field to '1'. Otherwise the base station shall set this field to '0'. If this is the first occurrence of PLMNID in this record, the base station shall set this field to '0'.

NumPLMNIDsNumber of PLMN IDs that are associated with this EARFCN

If the PLMNIDIncluded is set to '0', or if the PLMNSameAsPreviousChannel is included and set to '1', then the base station shall omit this field. Otherwise the base station shall set this field to one less than the number of PLMN IDs that are associated with this EARFCN.

PLMNID PLMN ID of the neighboring EUTRA system

The base station shall set this field to the PLMN-ID. The 12 most significant bits of the field are the 3-digit MCC in BCD format. The next 12 bits are defined for the MNC. For a 3-digit MNC, it takes all 12 bits in 3-digit BCD format. For 2-digit MNC, it is encoded as the 1st 2 digits in the first 8 bits, and then the last 4 bit shall be set to 0xF.⁶

⁶ The details about PLMN-ID is specified in [4].

4.6 1xCSFB Access Barring Support

E-UTRAN provides the access class barring parameters (ac-Barring) in the SIB8 [4]. When the ac-Barring values are set, the mobile station shall perform a persistence test only one time using a random value locally generated by the mobile station when the mobile station makes a voice call origination, SMS origination or registration. The persistence test procedure shall be based on [10]. The mobile station shall generate a random number RP, $0 < RP < 1$, using the technique described in the "Pseudorandom Number Generator" [12]. The persistence test passes when RP is less than the value of P (P is computed as detailed in [11] assuming the ac-Barring received in SIB-8 as PSIST values). If the persistence test passes, the mobile station may trigger a voice call origination, SMS origination or registration. If the persistence test fails, the mobile stations behavior is out of scope of this specification.

4.7 1x to E-UTRAN Handoff

4.7.1 Base Station support for Idle Handoff to E-UTRAN

If the cdma2000 1x Base Station supports idle handoff to E-UTRAN it broadcasts "E-UTRAN Neighbor List Record" as specified in section 4.5.2.1 using *Alternative Technologies Information* message as specified in [12] as radio interface type-specific fields⁷.

4.7.2 Mobile Station support for Idle Handoff to E-UTRAN

If the mobile station supports idle handoff from cdma2000 1x to E-UTRAN it follows the procedure to receive *Alternative Technologies Information* message as specified in [12] as radio interface type-specific fields. The mobile station processes the received "E-UTRAN Neighbor List Record" as specified in section 4.5.2.1 of this document.

4.8 MEID Support

The mobile station shall support MEID and give MEID value to E-UTRAN as defined in [4]. However, this does not mean the mobile station shall use MEID as MSID for 1x messages.

⁷ Although the *Alternative Technologies Information* message and the associated *System Parameters* message enhancement are specified in [12], the feature can be supported by base-stations supporting any earlier P_REV enhanced for interworking with E-UTRAN.