#### Limited k-th order Exp-Golomb binarization process

Inputs to this process is a request for a limited k-th order Exp-Golomb (EGk) binarization with variables k, maxPreExtLen and truncSuffixLen.

Output of this process is the limited EGk binarization associating each value symbolVal with a corresponding bin string.

The bin string of the limited EGk binarization process for each value symbolVal is specified as follows, where each call of the function put( X ), with X being equal to 0 or 1, adds the binary value X at the end of the bin string:

codeValue = symbolVal >> k  
preExtLen = 0  
while( ( preExtLen < maxPreExtLen ) && ( codeValue > ( ( 2 << preExtLen ) − 2 ) ) ) {  
 preExtLen++  
 put( 1 )  
}  
if( preExtLen = = maxPreExtLen ) (1552)  
 escapeLength = truncSuffixLen   
else {  
 escapeLength = preExtLen + k  
 put( 0 )   
}  
symbolVal = symbolVal − ( ( ( 1 << preExtLen ) − 1 ) << k )  
while( ( escapeLength− − ) > 0 )  
 put( ( symbolVal >> escapeLength ) & 1 )

#### Binarization process for abs\_remainder[ ]

Input to this process is a request for a binarization for the syntax element abs\_remainder[ n ], the colour component cIdx, the current sub-block index i, and the luma location ( x0, y0 ) specifying the top-left sample of the current luma transform block relative to the top-left luma sample of the picture, the current coefficient scan location ( xC, yC ), the binary logarithm of the transform block width log2TbWidth, and the binary logarithm of the transform block height log2TbHeight.

Output of this process is the binarization of the syntax element.

The variables lastAbsRemainder and lastRiceParam are derived as follows:

* If this process is invoked for the first time for the current sub-block index i, lastAbsRemainder and lastRiceParam are both set equal to 0.
* Otherwise (this process is not invoked for the first time for the current sub-block index i), lastAbsRemainder and lastRiceParam are set equal to the values of abs\_remainder[ n ] and cRiceParam, respectively, that have been derived during the last invocation of the binarization process for the syntax element abs\_remainder[ n ] as specified in this clause.

The rice parameter cRiceParam is derived as follows:

* If transform\_skip\_flag[ x0 ][ y0 ][ cIdx ] is equal to 1 and slice\_ts\_residual\_coding\_disabled\_flag is equal to 0, the Rice parameter cRiceParam is set equal to 1.
* Otherwise, the rice parameter cRiceParam is derived by invoking the rice parameter derivation process for abs\_remainder[] as specified in clause 9.3.3.2 with the variable baseLevel set equal to 4, the colour component index cIdx, the luma location ( x0, y0 ), the current coefficient scan location ( xC, yC ), the binary logarithm of the transform block width log2TbWidth, and the binary logarithm of the transform block height log2TbHeight as inputs.

The variable cMax is derived from cRiceParam as:

cMax = 6  <<  cRiceParam (1555)

The binarization of the syntax element abs\_remainder[ n ] is a concatenation of a prefix bin string and (when present) a suffix bin string.

For the derivation of the prefix bin string, the following applies:

* The prefix value of abs\_remainder[ n ], prefixVal, is derived as follows:

prefixVal = Min( cMax, abs\_remainder[ n ] ) (1556)

* The prefix bin string is specified by invoking the TR binarization process as specified in clause 9.3.3.3 for prefixVal with the variables cMax and cRiceParam as inputs.

When the prefix bin string is equal to the bit string of length 6 with all bits equal to 1, the suffix bin string is present and it is derived as follows:

* The suffix value of abs\_remainder[ n ], suffixVal, is derived as follows:

suffixVal = abs\_remainder[ n ] − cMax (1557)

* The suffix bin string is specified by invoking the limited k-th order EGk binarization process as specified in clause 9.3.3.6 for the binarization of suffixVal with variable k set equal to cRiceParam + 1, variable maxPreExtLen set equal to 11 and variable truncSuffixLen set equal to 15 as input.

#### Binarization process for dec\_abs\_level[ ]

Input to this process is a request for a binarization of the syntax element dec\_abs\_level[ n ], the colour component cIdx, the luma location ( x0, y0 ) specifying the top-left sample of the current transform block relative to the top-left luma sample of the picture, the current coefficient scan location ( xC, yC ), the binary logarithm of the transform block width log2TbWidth, and the binary logarithm of the transform block height log2TbHeight.

Output of this process is the binarization of the syntax element.

The rice parameter cRiceParam is derived by invoking the rice parameter derivation process for dec\_abs\_level[] as specified in clause 9.3.3.2 with the variable baseLevel set equal to 0, the colour component index cIdx, the luma location ( x0, y0 ), the current coefficient scan location ( xC, yC ), the binary logarithm of the transform block width log2TbWidth, and the binary logarithm of the transform block height log2TbHeight as inputs.

The variable cMax is derived from cRiceParam as:

cMax = 6  <<  cRiceParam (1558)

The binarization of dec\_abs\_level[ n ] is a concatenation of a prefix bin string and (when present) a suffix bin string.

For the derivation of the prefix bin string, the following applies:

* The prefix value of dec\_abs\_level[ n ], prefixVal, is derived as follows:

prefixVal = Min( cMax, dec\_abs\_level[ n ] ) (1559)

* The prefix bin string is specified by invoking the TR binarization process as specified in clause 9.3.3.3 for prefixVal with the variables cMax and cRiceParam as inputs.

When the prefix bin string is equal to the bit string of length 6 with all bits equal to 1, the suffix bin string is present and it is derived as follows:

* The suffix value of dec\_abs\_level[ n ], suffixVal, is derived as follows:

suffixVal = dec\_abs\_level[ n ] − cMax (1560)

* The suffix bin string is specified by invoking the limited k-th order EGk binarization process as specified in clause 9.3.3.6 for the binarization of suffixVal with variable k set equal to cRiceParam + 1, variable maxPreExtLen set equal to 11 and variable truncSuffixLen set equal to 15 as input.

#### Binarization process for abs\_mvd\_minus2

Input to this process is a request for a binarization for the syntax element abs\_mvd\_minus2.

Output of this process is the binarization of the syntax element.

The abs\_mvd\_minus bin string is specified by invoking the limited k-th order EGk binarization process as specified in clause 9.3.3.6 with variable k set equal to 1, variable maxPreExtLen set equal to 15 and variable truncSuffixLen set equal to 17 as inputs.

NOTE – Binarization scheme is equivalent to representing abs\_mvd\_minus2 value less than equal to 217 − 3 is represented by EG1 binarization. The largest value 217 − 2 is represented as 0xffff0000.