CWMS Database Schema 18.1 Changes

Additions and Updates from CWMS Database Schema 3.0

# Background

This document describes the changes made to the CWMS Database Schema from the previous production version (3.0.7) to the current version (18.1.1). Schema version 3.0.7 was implemented as a series of sub-versions (3.0.7.1 – 3.0.7.9), with each sub-version being the state of the schema files in the source code repository. However, the CWMS Database cannot store the version in this fine of detail, being only able to store the major, minor, and patch version numbers. Thus all versions 3.0.7.1 -3.0.7.9 are labeled in the databases simply as 3.0.7. Because of this situation, this document will describe the changes between the 3.0.7 sub-versions as well as the changes from version 3.0.7.9 to 18.1.1.

The version numbering scheme has been changed from one loosely aligned with the current version of the CWMS version, which was found to cause confusion when discussion CWMS versions and database schema versions, to a scheme in which:

* The major version is the last two digits of the year the schema is released
* The minor version is a serial number of releases within the same year, beginning at one
* The patch version is the serial number of patches to the major.minor version, beginning at one

No sub-versions are expected to be used for the database schema from this time forward.

## Changes from 3.0.7.1 to 3.0.7.2

Sub-version 3.0.7.2 was created on 6 Jul 2017.

* Implement login triggers for RDL/CCP permissions
* Loading RADAR XSL transforms

## Changes from 3.0.7.2 to 3.0.7.3

Sub-version 3.0.7.3 was created on 13 Jul 2017.

* Added RETREIVE\_STREAM\_REACH2, removed AT\_STREAM\_REACH\_T01 and modified STORE\_STREAM\_REACH to perform checks formerly in trigger.
* fixing delete\_turbine

## Changes from 3.0.7.3 to 3.0.7.4

Sub-version 3.0.7.4 was created on 21 Jul 2017.

* Added CAT\_RATINGS2, CAT\_RATINGS2\_F, CAT\_EFF\_RATIINGS2, CAT\_EFF\_RATINGS2\_F to include ratings with parent ratings and into include info about the parents ratings
* Add dest\_flag to TSV tables so that it easy to filter data to streams to National DB/DMZ
* Added allowance for "NAVD 88" and "NAVD-88" instead of just "NAVD88" in STORE\_VERTICAL\_DATUM\_OFFSET (same for NGVD29).

## Changes from 3.0.7.4 to 3.0.7.5

Sub-version 3.0.7.5 was created on 29 Aug 2017.

* Bugfixes for reverse rating through USGS-style stream ratings
* Added rounding of shift on revesrse\_rate to produce same results as java code
* Bug fixes for location level indicators
* Modified AV\_LOC2 to improve performance. Added db\_office\_code to the end of the columns
* Added capability to retrieve ratings XML without rating or extension points.
* Added tables/view/routines for registering & unregistering named subscribers for queues.
* Modified delete\_ratings, removed trigger at\_rating\_value\_trig
* Modified to allow $*n* in addition to I*n* and ARG*n* in formula specification.

## Changes from 3.0.7.5 to 3.0.7.6

Sub-version 3.0.7.6 was created on 12 Oct 2017.

* Fixed missing time zone bug in streamflow\_meas\_t constructor from xml, also use location time zone if no time zone ID in date/time string
* Fixes for ratings with extensions
* Made log\_db\_message() an autonomous transaction
* Modification to accommodate longer UPASS phone number
* Modified so that a table rating with no values creates a dummy table of 0,0 instead of raising an exception.
* Bugfix in RETRIEVE\_RATINGS for retrieving ratings with identical aliases.
* Fixed: numbers weren't recognized as valid tokens in source rating expressions
* Fixed: typo could poplulate transitional rating with source ratings in wrong order in constructor from xml
* Cleaned up cursor leaks.
* Added ability to filter out duplicate time/value/quality items when storing data. Also changed code for filtering NULLs from cursor loops to SQL statements.
* Modified DELETE INSERT code to work consistently and filter duplicates if specified. Changed all GMT time zone references to UTC

## Changes from 3.0.7.6 to 3.0.7.8

Sub-version 3.0.7.8 was created on 24 Jun 2018. Sub-version 3.0.7.7 was skipped.

* Fixed bug in deleting ratings with extension values.
* Fixed bug that prevented inactive shifts from being returned in usgs-rating-rating objects.
* Fixed bugs in database ratings that prevented falling back from log to linear interpolation. Expected LOG(10, X) to raise an exception on X <= 0. It doesn't.
* Modified ctor from xml to raise an exception if a shift effective date is earlier than the rating effective date
* Fixed bug in RETRIEVE\_RATING\_OBJ\_EX that would leave rows of the returned table NULL if the catalog returned a specific rating code in more than one row.
* Added STORE\_CONTRACTS2() that allows specifying whether to ignore NULL values in the input data.

## Changes from 3.0.7.9 to 3.0.7.9

Sub-version 3.0.7.9 was created on 21 May 2018.

* Allow "Count" to be used as a proxy for gate opening if no other suitable parameter exists.

## Changes from 3.0.7.9 to 18.1.1

* Changes for Access2Water
* Added 'GENERAL' configuration category, moved <NULL>/'OTHER' configuration to 'GENERAL/OTHER'
* Added AT\_TS\_EXTENTS table and modified time series extents routines.
* Added historic time series flag
* Added location level labels
* Added location level sources
* Added scheduler monitoring and job authorization
* Added views for time series text
* Adding CWMS Pools
* Adding keyed log messages
* Revoke public grants to restricted packages and grant them directly to CWMS user for STIG compliance
* Changes to CWMS\_FORECAST
* Changes to DELETE\_LOCATION\_LEVELxx
* Database logging changes
* Lengthend PUBLIC\_NAME from 32 to 57 bytes.
* Lengthened BASE\_LOCATION\_ID from 16 to 24
* Modified CWMS\_LOC.SET\_VERTICAL\_DATUM\_INFO to delete all current info before storing incoming infor.
* Modified GET\_LOCATION\_ID to be able to retrieve location ID by public name (if unique in office)
* Modified SEND\_MAIL to use CWMSDB property "email.mail-exchanger", but default to "gw2.usace.army.mil" for email server
* Modified STORE\_GATE\_CHAGNES, RETRIEVE\_GATE\_CHANGES/\_F, STORE\_TURBINE\_CHANGES, and RETRIEVE\_TURBINE\_CHANGES/\_F to recognized the default vertical datum, if set, and to allow unit spec format of U=<unit>|V=<datum>. Unit specs for retrieve routines are in P\_UNIT\_SYSTEM instead of units (e.g., U=EN|V=NAVD88) and are in individual change times (much easier to use default vertical datum) for store routines.
* Moved common REGI "lookup table" data to CWMS-owned records
* Rewrote RETRIEVE\_TURBINE\_CHANGES to improve performance
* Added index on dep\_rating\_ind\_param\_code column for at\_rating\_value to prevent database lock up when deleting/updating ratings.
* updates for virtual ratings