Hydro Database Manager – a.k.a. HydroBase

Task List

Note: **Important!** You MAY have had stations set to **No Post** so they are NOT showing up in HydroBase and NOT being used by any WHFS Applications. This could have been due to a bad gauge, ice, etc., but now the readings may be accurate. You could check the USGS web site (if applicable) to see if current readings are correct and then toggle the flag for posting the data back on so this station will show in the Show SHEF Post setting case.

For any GUIs that come up, select **Apply** to apply a change and leave the GUI open or select **OK** to apply the change and close the GUI.

Launch HydroBase from Hydro perspective

- **HydroApps** > **Hydro Database Manager**
- Enter HydroBase password (if you don't require a password, you SHOULD!!)

Change HydroBase Password in HydroBase

- **Setup** > **Administration** (password is in ASCII)

Sort HydroBase stations by **Station ID** (default) or **Station Name**

- main window at bottom - **Sort By:** Station or **Sort By:** Name
- permanent change - **File** > **Preferences** select radio button in **Sort Criteria**

To see which stations in HydroBase set to **No Post** (i.e., they have the **Post Observed Values** flag toggled **OFF**)

- main window at bottom – click **Station List Filter Options**
- **Show SHEF Post** (toggle this OFF)
- **Show SHEF No Post** (toggle this ON)
- If Show SHEF No Post is OFF (default), these stations set to No Post will not display in HydroBase
- Gauges may have had Post turned OFF due to bad gauges, ice effects, etc., so check this periodically and at least seasonally.

Select a station by Station ID

- Main window at bottom – **Station Search** : (enter ID in Search box)
- Mow **Location** and **River Gage** options, etc., apply to this station

Location menu options (see Section 4 of the **Guide**)

Check if a station is set to **Inactive**

- **Location** > **Modify Location** (Geophysical page) > **Inactive** (checked = ON)
- Makes RiverPro IGNORE this station! - OFF by default

Check that station is set to **Post Observed Values** (via EDEX shefdecode process)

- **Location** > **Modify Location** (Additional Info page) > **Post Observed Values** (checked = ON to post to hydro database)

To modify station attributes (static data): Select a station, then …

Location > **Modify Location** (Geophysical page)

- **Inactive** - default = NOT checked
  - toggle flag **ON** to make **RiverPro ignore station** (not displayed or used)
- **Revise** button – toggle button ON to set revision **Date** to today's date in correct format
- **Basin** - displayed name in HydroBase
- **Detail -** miles and direction from Name (i.e., Post Office)
- **Lat/Lon** - in decimal degrees
- **Network** - select classification of station
- **RFC** - select RFC area for station
- **Elevation** - elevation of gauge above ground level (**Note**: NOT a zero datum!)
- **Station Num** - typically USGS (or other gauge owner) station number
- **County/State** - County and State where gauge is located
- **HSA** - WFO Hydrologic Service Area responsible for this Location
- **WFO** - WFO responsible
- **Time Zone** - select correct time zone

To modify additional station attributes (static data):

Location > **Modify Location** (Additional Info page)

- **Description** - any detail you wish to add (obsolete to **Remark** in **riverstat** table)
- **Information** - any detail you wish to add (obsolete to **Remark** in **riverstat** table)
- **Horizontal Datum** - make sure to note current datum and update any change
- **Hydrologic Unit** - HUC – Hydrologic Unit Code – for the basin / location
- **Begin Date** - station start date
- **Station Type** - typically R(river), P(precip), O(observer), I(inactive), U(unknown)
- **Post Observed Values** - checked = ON (default) means station will display in HydroBase when **Show SHEF Post** is toggled **ON** and data displays in the Hydro perspective
- **Setup + Apply Cooperating Agencies/Offices** – opens a GUI to apply a cooperating agency and associated office to that station, and display them in the Agency / Office box to the right

- **Copy to New Location** - opens a GUI to allow you to duplicate a station
  - Use to create dummy/test stations (for testing, drills, etc.)
  - Use to add a "new" station – pick another station in the same basin (if possible) with similar characteristics (this ensures you fill in the minimum required attributes to fill the required columns in the Location table)
  - For a new station, copy **Reference Data Only**
  - For a test station, you may copy **All Data** (takes longer)
  - See **Job Sheet** for examples

To modify other station attributes: Select a station, then …

Location > **Contacts**
Location > **County/Zone UGC**
Location > **Gage History**
Location > **Data Sources** (**Type** pulldown to select DCP / Observer / Telemetry to edit)

River Gage menu options (see Section 5 of the **Guide**)
To modify **river station** attributes (stored in **riverstat** table): Select a river station, then…

River Gage > **River Gage** (Geophysical page) –

- **Stream** – name of stream or river
- **Revise** - toggle button ON to set revision **Date** to today's date in correct format
- **Lat/Lon** - degrees decimal
- **Drainage Area** – in square miles
- **River Mile** - gauge location from upstream point in miles
- **Flood Stage** - should match **Minor** value in **River Gage** > **Flood Category**
- **Flow** - flow value (cfs) at **Flood Stage**
- **Action Stage** – stage at which **staff** or **users** begin to take some **Action**
  - may be the same as forecast **Issuance Stage**
- **Flow** - flow value (cfs) at **Action Stage**
- **Zero Datum** - a.k.a. "**gauge zero**" – the elevation (usually in feet above mean sea level – MSL) where the river gauge reads 0.00. Usually this is below the streambed to account for scour situations so the gauge reading is always > 0.0
  - **Note**: **Critical** - document **zero datum** reference on **Additional Info** page under **Vertical Datum** (e.g., **NGVD 1929**, **NAVD 88**, etc.)
- **Issuance Stage** - (**new column**) – stage at which the RFC is required to issue a forecast
- **Issuance Flow** - (**new column**) – flow (cfs) at **Issuance Stage**
- **Threshold Runoff** – value (inches) of threshold runoff variable used for SSHP points –derived from use of a digital elevation model dataset and GIS
- **Remarks** - any pertinent information (255 chars max)
- **Forecast Point Group Assignment** - GUI to assign location to a RiverPro Forecast Group (**Clear** will remove point from a forecast group)
  - **Note**: Also see **Setup** > **RiverPro Forecast Groups/Points**

- **Primary Stage/Flow Physical Element – must** be selected so that Hydro perspective displays data for the "Primary" choice for any Physical Element
    - MapData > Point Data Control (Elements) → Primary for the "primary" PE data to display in the Hydro perspective for that point.
    - **Note:** used by **RiverPro** for Observed and Forecast time series
- **Use Latest Forecast When Computing Maximum Forecast Value**
    - Recommended to keep this toggled **ON** to always use the latest forecast

To modify additional **river station** attributes …

River Gage > **River Gage** (Additional Info page) –

- **Period of Record** – start (and end, if applicable) date for this station
- **Lat/Lon Source -** USGS records, GPS (verify **Horizontal Datum** on Location > Modify Location-Additional Info page), etc.
- **Level - Agency** and **date** of latest vertical elevation validation of the **gauge**, which is usually checked by the gauge owner on a station visit. The **Level** (Elevation) is recorded in the Location > Modify Location > **Elevation** box (this is NOT the Zero Datum)
    - If a NWS wire weight or staff gauge, or a rain gauge, it would be your job
    - If USGS or other partner gauge, it may be in the Station Description
- **Vertical Datum -** the reference datum used for the Zero Datum from the River Gage (Geophysical page)
- **Rated -** agency responsible for the rating (stage vs flow curve)
- **Date of Rating -** date of latest rating curve
- **USGS Rating No. –** rating curve number for USGS points
- **Tidal Effect –** any tidal effects?
- **Backwater –** any backwater effects?
- **USGS No -** USGS station number
- **Bankfull -** stage when river is at bankfull
- **Check Bar –** check bar reading on wire weight gauge
- **Pool –** normal pool elevation (top of conservation pool), in feet above MSL (also conserpool in **reservoir** table)

To modify related river station info under the top menu **River Gage >**

Flood Category - set Minor, Moderate, Major stage & flow
Impact Statement – define impacts at specific high water stages

- use the Save to File button to save impacts to a file for that station
- be careful not to overlap months between **BEGIN** and **END** dates

Low Water Statement – define information related to low water impacts

- impacts will appear on AHPS public pages

Flood Damage – define flood impacts that appear in E-19's (not RiverPro)
Rating Curve – opens an editor to display or modify a rating curve

- use of the **RUHT** program is the best way to import rating curve updates

Unit Hydrograph – opens an editor to display or modify a unit hydrograph

- SSHP stations require a unit hydrograph
- the editor may list more than one unit hydrograph
- see pp 23 & 24 of the **Guide** for where to put an updated file to use

Crest History – use this GUI to add detail to flood crests

- mark them as Preliminary Status, Official Crest, Record Crest
- add any other remarks

Low Water – modify attributes for low water events

- this info displays in E-19 and on public AHPS pages

Benchmark – use to catalog known elevations around the gauge

Datum – enter or update the **Zero Datum** (elevation where gauge = 0.0 feet)

- usually below streambed to avoid negative stages
- **Note**: also update in River Gage > River Gage > **Zero Datum**
- **Note2**: document **reference** datum (e.g. NAVD 88, NGVD 1929) in …
    - River Gage > River Gage > Additional Info > **Vertical Datum**

Description – add any description information here, including the text for "**Reach**"

- **Proximity** – at top of GUI, used by RiverPro
- **Reach** - used by RiverPro as Reach variable, and to denote if a weir location
    - general text description with 80-character maximum
- **Affected Area** – many offices put lat/lon pairs for simple gauge reach polygon here (available for plotting on national warning maps
- additional items such as stream bed, freezing impacts, regulation impacts

Publications – document publications containing info (usually USGS docs per state)

References – document references containing info

- USGS publications
- USGS Station Description
- Previous E-19

Reservoir menu options - see **Section 6** of the **Guide**, pg 29

This GUI holds specific reservoir/dam information.

- Also see **Setup** > **Reference Fields** to specify reservoir **Owner** or **Type**
- see Section 9.3 of Guide for Setup > Reference Fields

Data Ingest menu options - see **Section 7** of the **Guide**

Data Ingest Filter –
This is used to update the **ingestfilter** database table. The SHEF plug-in for EDEX uses data in this table to …

- specify which data saves to which PE tables or passed on for use by other applications
- If the **shef_load_ingest** token is **ON** (default) then new entries add to **ingestfilter** table as they arrive
- TypeSource **rank** is used by RiverPro, with a rank of 1 as the highest and treated as "official" by RiverPro
    - Use this to assign a rank of 2 to a "backup" river gauge, etc.
    - If the primary gauge fails, the secondary will be used if available, etc.
- Check the **Location** checkbox, then enter an ID in the **Location** box
- To only view river stage data, for example, check the **PhysElem** checkbox and choose **HG**
- Check the **TypeSrc** checkbox to only view one type of data such as FF (forecast), RG (GOES = observed), or one of the Contingency options (C1 – CZ), etc.
    - Choose the type to see under the TypeSrc pulldown (defaults to C1 for HG PhysElem data)
- **Note**: Pay attention to the fact that the **columns** do not line up with the **headers** in the displayed table - this is important to know when working with **Switches**
- When you have a station selected, and perhaps a PhysElem, note the Switch (Master, OFS, MPE) flags (T = True or F = False)
- For data you wish to store in the database and/or see in the Hydro perspective or other apps, be sure the Master = T
- OFS is an RFC flag you can ignore at the WFO
- MPE tells whether MPE should use the (precip) data, so if there are multiple gauges at a site and you want to use the GOES PP 1-hour reports, make sure that the PP RG type for duration 1001 has MPE = T, etc.
    - Remember, even if you never look at MPE it is running on your system and is the primary precip input for SSHP forecast points
- **Note2**: Under the main display table is a Set Switches for All Listed Above button…BE VERY CAREFUL!!!
    - If you select (or don't select) a Switch (Master, OFS, MPE) checkbox here then click the button, it will APPLY those choices to ALL STATIONS in the display
    - If you have NOT filtered by Location, it will set them for ALL STATIONS IN YOUR DATABASE!
    - This cannot be undone (without lots ow work using **psql**)

Adjustment Factors - use to apply an adjustment to data values, such as a rating shift or some other correction (convert a local value to MSL, etc.) as the data comes in

- see Section 7.2, page 32, of the **Guide**

QC / Alert / Alarm Limits - see **Section 7.3**, page 33, of the **Guide**

- GUI is used to set **Gross** and **Reasonable Range** checks for all data by PE in the **Default Limits** page
- Use it to assign station-specific **Range** checks plus **Alarm** and **Alert Limits** settings in the **Location Limits** page
- **ROC** (Rate-Of-Change) limits may be set (**Note**: these are in **units per hour**)
- **Diff** (Difference) limits for consecutive observations may be set

This information was covered in the **Hydro Perspective** course.

- See this **DataQC.png** diagram to compare Good, Questionable, and Bad data
- Data above a **Gross Max** or below a **Gross Min** are flagged as **Bad** and posted to the **rejecteddata** table or that physical element table (**height**, **temperature**, etc.) based on the value of the **shef_post_baddata** token in the **Apps_defaults** file
- Data between Gross Max and Reasonable Max or between Reasonable Min and Gross Min is QC-flagged as Questionable
- Data between Reasonable Max and Reasonable Min is flagged as Good

- Set Alarm and Alert Limits that will trigger Alarms or Alerts as data exceed them with care and agreement in your office for alert frequency

See these **Resources** from the Hydro Perspective course for additional details.

- **QCalarmAlertLimits1Annotatated.png** - annotated diagram of **Default Limits** page of Quality Control and Alert/Alarm Limits GUI (at end of this document)
- **QCalarmAlertLimits2Annotatated.png** - annotated diagram of **Location Limits** page of Quality Control and Alert/Alarm Limits GUI (end of document)
- **Alert and Alarm** document on WFO_Support page
- **IHFS Quality Control** document on WFO_Support page
- See **Lesson 5.2 Alarm/Alert Issues** in **WHFS Focal Point Hydro Perspective** course

Purge Parameters - see **Section 7.4 Data Purge Parameters** of the **Guide**

Use this Data Purge Parameters GUI to set purge time (by hours).

- The top half refers to location data (by table name)
- The bottom half refers to text products (by Product ID)

Beware of filling disk space, etc., if you store too much data. Work with your ITO.

Reports menu options - see **Section 8.0** of the **Guide**

Flood Reports

- Use this GUI to display data above Flood for a selectable period of time or HSA
- Use to highlight data and insert into **crest** table, or delete from **floodts** table

Text Reports

- Use this option to open GUIs for E-19, E-19A, B-44A (Cooperative) reports.
- Use to display a Sorted Station List
- Use to display a Station Class List
- Use to display a Service Backup List

Setup menu options - see **Section 9.0** of the **Guide**

Administration

- use this GUI to set Station ID, HydroBase password, and your (HPM) contact information

Reference Fields

- use to update the **damtype** or **resowner** reservoir reference tables

States/Counties/Zones

- use to assign WFOs to Counties or Zones (as responsible, Primary, Secondary)

RiverPro General Parameters

- assign default **Lookback**, **Lookforward** hours
- assign default string values for missing data
- assign default **Number of Hrs Before Expiration** for RVS, FLS, FLW

RiverPro Forecast Groups/Points

- Upper half controls changes to the **Forecast Groups** (ID, NAME, ORDER) and whether to include non-flood points in the group for a flood warning/statement for that group (**Recomm All** – toggle ON to include)
    - Includes assigning Primary and Secondary HSA Backup for Forecast Points
    - Remember, assign the "**host**" HSA in **Location** > **Modify Location**
    - Click **Apply FcstGroup** button to apply changes
    - **Add Group** and **Delete Group** buttons are at the bottom of the GUI
- Lower half controls changes to **Forecast Points**
    - Click the **Apply FcstPoint** button to apply changes
- Review section 9.1.3 of the RiverPro manual from the WFO_Support webpage

Radar Locations

- This GUI supports the MPE application, which runs automatically at all WFOs even if it is never used
- It also allows you to select whether to use the WFO Bias or RFC Bias calculation for each radar
- See Section 9.7, and follow other documents on MPE, Bias, etc., on WFO_Support
- Be sure to talk with the HAS forecasters at your supporting RFC(s) for additional details on MPE, etc.

Areal Definitions

- This GUI allows you to update the **basins.dat**, **resvrs.dat**, **counties.dat**, or **zones.dat** files
- These files may be used by applications – for example, **SSHP** uses **basins.dat**
- Read **Section 9.8 Areal Definitions**
- **NOTE**: If you select a file to edit, even just to update one basin boundary, when you click Import to Database it will delete the ENTIRE **basins.dat** file before the import!! Be sure you know what you are doing (i.e., make a BACKUP copy before editing!!!)
- The files are in **/awips2/edex/data/share/hydroapps/whfs/local/data/geo**
- **NOTE**: AWIPS-2 uses shapefiles to handle base geographic data

NWR Transmitter Towers

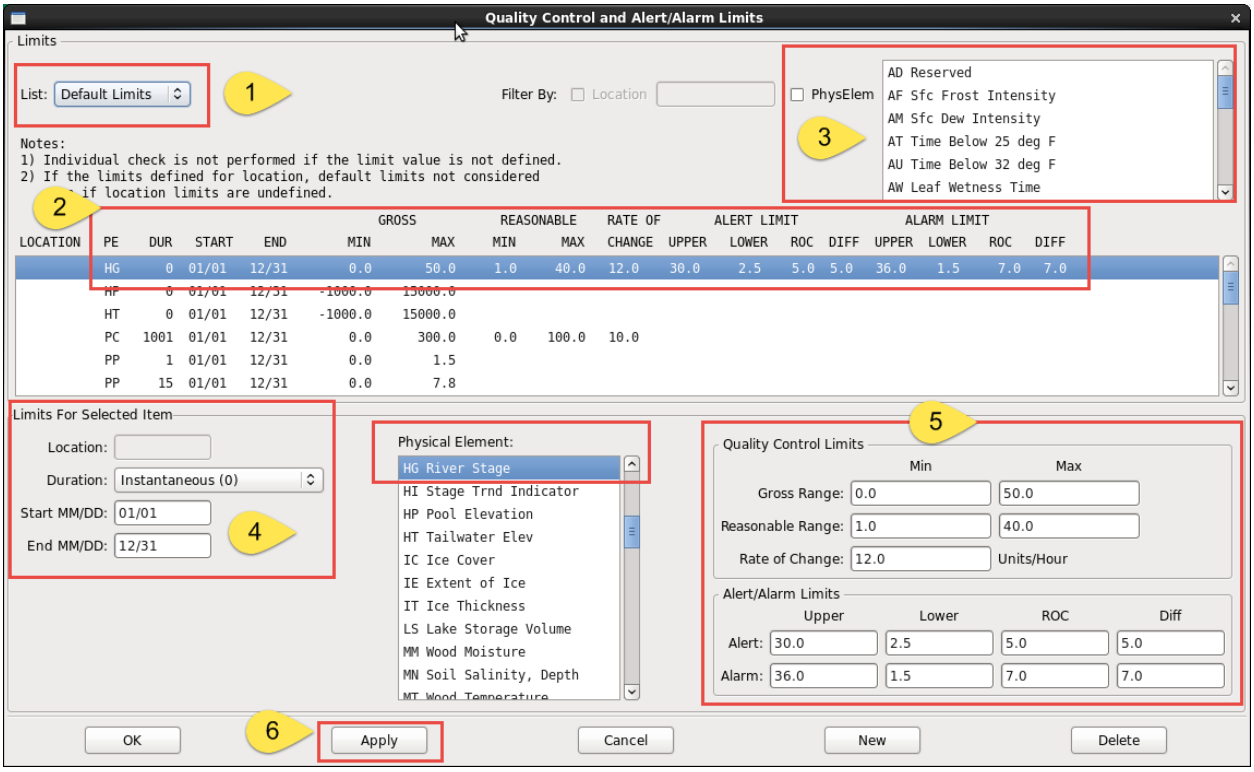
- Use this GUI to manage NOAA Weather Radio Transmitter information if you use RiverPro to create products for the weather radio

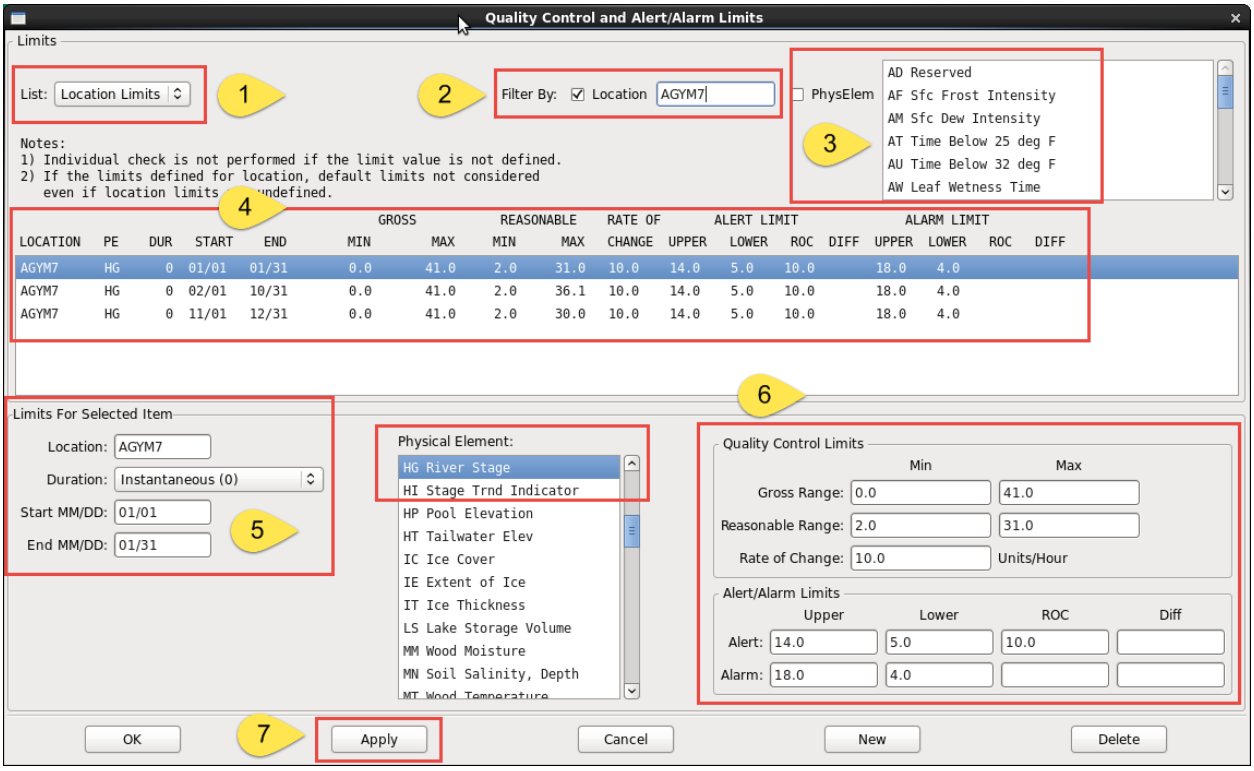
TimeSeries Group Configuration

- This option will open the Localization perspective and open the SITE version of **group_definition.cfg** used to configure the Hydro Time Series application
- See the **Time Series Operations Guide** from the **WFO_Support** page

HydroGen Configuration

- See Section 9.12 Hydrogen Configuration (p46 of 46)
- This GUI accesses the **hgstation** table, which controls data flow from the WFO to AHPS
- Refer to the documentation on WFO_Support under HYDROGEN/AHPS


Quality Control and Alert/Alarm Limits
Limits
List: Default Limits
1
Filter By: Location
PhysElem
AD Reserved
AF Sfc Frost Intensity
AM Sfc Dew Intensity
AT Time Below 25 deg F
AU Time Below 32 deg F
AW Leaf Wetness Time
3
Notes:
1) Individual check is not performed if the limit value is not defined.
2) If the limits defined for location, default limits not considered
if location limits are undefined.
2
LOCATION PE DUR START END GROSS MIN MAX REASONABLE MIN MAX RATE OF CHANGE ALERT LIMIT UPPER LOWER ROC DIFF ALARM LIMIT UPPER LOWER ROC DIFF
HG 0 01/01 12/31 0.0 50.0 1.0 40.0 12.0 30.0 2.5 5.0 5.0 36.0 1.5 7.0 7.0
HP 0 01/01 12/31 -1000.0 15000.0
HT 0 01/01 12/31 -1000.0 15000.0
PC 1001 01/01 12/31 0.0 300.0 0.0 100.0 10.0
PP 1 01/01 12/31 0.0 1.5
PP 15 01/01 12/31 0.0 7.8
Limits For Selected Item
Location:
Duration: Instantaneous (0)
Start MM/DD: 01/01
End MM/DD: 12/31
4
Physical Element:
HG River Stage
HI Stage Trnd Indicator
HP Pool Elevation
HT Tailwater Elev
IC Ice Cover
IE Extent of Ice
IT Ice Thickness
LS Lake Storage Volume
MM Wood Moisture
MN Soil Salinity, Depth
5
Quality Control Limits
Min Max
Gross Range: 0.0 50.0
Reasonable Range: 1.0 40.0
Rate of Change: 12.0 Units/Hour
Alert/Alarm Limits
Upper Lower ROC Diff
Alert: 30.0 2.5 5.0 5.0
Alarm: 36.0 1.5 7.0 7.0
6
OK
Apply
Cancel
New
Delete


Quality Control and Alert/Alarm Limits
Limits
List: Location Limits
1
2
Filter By: Location AGYM7
PhysElem
AD Reserved
AF Sfc Frost Intensity
AM Sfc Dew Intensity
AT Time Below 25 deg F
AU Time Below 32 deg F
AW Leaf Wetness Time
3
Notes:
1) Individual check is not performed if the limit value is not defined.
2) If the limits defined for location, default limits not considered
even if location limits are undefined.
4
LOCATION PE DUR START END GROSS MIN MAX REASONABLE MIN MAX RATE OF CHANGE ALERT LIMIT UPPER LOWER ROC DIFF ALARM LIMIT UPPER LOWER ROC DIFF
AGYM7 HG 0 01/01 01/31 0.0 41.0 2.0 31.0 10.0 14.0 5.0 10.0 18.0 4.0
AGYM7 HG 0 02/01 10/31 0.0 41.0 2.0 36.1 10.0 14.0 5.0 10.0 18.0 4.0
AGYM7 HG 0 11/01 12/31 0.0 41.0 2.0 30.0 10.0 14.0 5.0 10.0 18.0 4.0
6
Limits For Selected Item
Location: AGYM7
Duration: Instantaneous (0)
Start MM/DD: 01/01
End MM/DD: 01/31
5
Physical Element:
HG River Stage
HI Stage Trnd Indicator
HP Pool Elevation
HT Tailwater Elev
IC Ice Cover
IE Extent of Ice
IT Ice Thickness
LS Lake Storage Volume
MM Wood Moisture
MN Soil Salinity, Depth
Quality Control Limits
Min Max
Gross Range: 0.0 41.0
Reasonable Range: 2.0 31.0
Rate of Change: 10.0 Units/Hour
Alert/Alarm Limits
Upper Lower ROC Diff
Alert: 14.0 5.0 10.0
Alarm: 18.0 4.0
7
OK
Apply
Cancel
New
Delete