Copy Raw Water Level & Site Data
Site Name_Raw

Water Level data:
Required to process this before generating flow for the site

Collate the Processing Information

Field Inspections
- Photocopy Inspection chits
- Photos
- Check Data - Load from Logsheet Loader for period of processing
- NCRs— Save .pdf of them in processing folder

Surveys?

Survey Information
- Construct/update Datum Continuity Tables
- Cross reference field inspection References with the surveys
- Do field inspections and surveys make sense?
- Load Cross Sections into Hilltop if not already there (refer to Cross Sections SOP)

Calibrations?

Calibration Information
- Check Asset for Calibration history (NOTE: Make sure latest information is loaded into Asset Manager – if not load from Paul's calibration spreadsheets)
- Save a .pdf copy of Calibration forms from Asset (can be obtained from Paul's calibration sheets but NEED to be in Asset)

Gaugings?

Gauging Facecards
- Copy all gaugings from Hydrometric Archive – any not on there find & archive (if can't find/decision on hold for archiving, gauging will be assigned QC 200 – *this is last resort option!!! Will not be archived until gauging archived*)
- Use the start/end ExSG/EPB as Check data (if not already loaded; check correct)
- Cross reference the Facecards Reference to those on the field inspection chit

Transform data to Working file
<Working>

1) Select **Water level statistics → Water level statistics: Point Sample** data source
2) Right click on the data source and click 'Transform'; make sure have changed DataSource to 'Water Level'
3) Save to the Working file

Load the Check Data

Obtain from Logsheet Loader. Check it matches what is on the Logsheets

NOTE: To comply with NEMS so data can achieve QC 600 needs to be recorded at 5 minute point sample with < 20 second averaging. Current 'Water Level' datasource is > 20 second averaging across 5 minutes

Populate the Water Level Processing Register

Register contains default equations used to calculate the underlying QC as long as the Check data & Site offset information is entered into it. NOTE: EPB used as primary check over ESG.

NOTE: Apply Hidden Gaps to the Data before any other edits are made

All edits to the data require a corresponding Quality Code & Comment
- All minor editing < 3 hours = QC 500
- Smoothing/applying virtual measurements = QC 400
- Visual interpolation > 3 hours = QC 300
- Generating Stage from neighbouring site/Synthetic relationships = QC 300

Edit the data
Use Crtl + Q function

Ramp corrections to the Data:
- All ramp corrections < 7 days and within 10 mm = QC 500
- All ramp corrections > 10 mm = QC 400
- All ramp corrections > 7days = QC 400

Recommended to apply ramps & transformations in a separate, 'Corrected' file from the 'Working' file in case applied incorrectly (easier to redo/fix)

Transformation of data does not alter QC as it is changing the 'offset' of the data to bring it inline with External Reference Checks (however ramping between transformations does alter the data)

Backup data from the site can obtain maximum QC 500 if sufficient evidence, otherwise QC 400

Missing record QC 100 – should ideally NOT have any missing Water Level data!

Any sensor that fails calibration = QC 500 applied from the previous calibration
Sensor outside of calibration = QC 500 from midnight next day 1 year from last calibration to next time calibrated & pass (e.g. if last calibration 1/01/2016 then QC 500 from 02/01/2017 00:00)

Add Quality Code to the data

- Final Difference between Check +/- error and Logger value **≤ 3 mm or ≤ 0.2%** Effective Stage = **QC 600**
- Final Difference between Check +/- error and Logger value **≤ 10 mm or ≤ 0.5%** Effective Stage = **QC 500**
- Final Difference between Check +/- error and Logger value **> 10 mm or > 0.5 %** Effective Stage = **QC 400**
- Synthetic Data = **QC 300**
- Unverified or Cautionary Data = **QC 200**
- Missing Record = **QC 100**

Update the Water Level Processing Register & Comments Spreadsheets

- Update final Logger values for each inspection
- Update final QC of the data for each inspection
- Add Processing Comments and Synthetic inspections where necessary to Register
- From the Audit trail import Comments made when editing
- Separate Comments into 'Archive' & 'Processing' tabs – the latter includes all comments, whereas the former is only comments relevant for the enduser

NOTE: The Register should reflect the raw data and the final Water Level data that is going to the archive.

Copy Water Level data to final file
<Site Name>

From Register, copy:
- the Inspections Date & Time, Check Data, Check data error, Raw Logger values & Final Logger values into the **Master Water Level** excel spreadsheet for each site. This can be found in:
  \\ares\environmental data validation\water level\<sitename>

Does the site have Flow record?

NO

Copy final site file to the **Provisional Archive NEMS V1**
<Sitename>

Print off to hand in:
1. FDT (Raw, Final details, Comments, Quality Code)
2. Final Plot + QC
3. Raw/Final/Audit
4. Water Level Processing Register (for the batch, not the Master Register)
5. Plots: Drift over time and Reference Checks over range
6. Batch Comments : Archive & Processing Comments
7. NCRs
8. Surveys: Datum Continuity table

NOTE: Can include more information, the above is what is required as a minimum to assist with determining the right decisions were made to correct the Water Level and associated derived flow data. Also very useful annotating printouts (and putting review comments in excel spreadsheet) to assist with the review & archiving process

YES

Flow Data: Ratings
Use the cleaned Water Level data to process the flow data and **Rating curves** for the site

Ratings are created in the same batch as the processed Water Level.

August 2016

Copy <Site Name> Water Level
Ratings

Copy in all gaugings into Ratings
Including Facecard & Gauging Results

Quick way to figure out corrected Water Level for gauging:
1) Add Check data to the Ratings file water level data → This Check data will be the date, time and original stage assigned to the gauging
2) In your excel spreadsheet run the Marco that pulls out the Check data and Logger Water Level value
3) From this copy the Logger Water level values into the Gauging Results stage values to correct the gaugings to the processed Water Level data

Correct Stage of Gaugings to corrected Water Level

This is done by opening the 'Gauging Results' and changing the Stage value assigned with the gauging

Copy in Ratings from the Provisional Archive

Check the last ~years worth of ratings are appropriate; the most recent rating from the preceding batch may need tweaking as more information (i.e. gaugings) has become available so is common for this one to be edited.

Is there a Rating change?

YES

NO

Under NEMS Ratings 2016 the following apply:
- there shall be a comment associated with each rating change.
- a comment shall be filed if a gauging does not plot on a rating curve with the reasons given as to why this is.
- 95% of all gaugings shall plot on a rating curve

Do additional Ratings, justify and Rating change. Apply Effective and Start time.

Make no changes to the existing rating curve

Verify flow data generated from the Ratings is sensible

- Compare with upstream/downstream/catchment flow (ideally should be working down the catchment for this reason)
- Compare with Rainfall sites – Water Balance
- Run statistics: Min, mean, max annual flow for the site -is this representative during time period in question?
- Cross Section analysis – is the generated flow appropriate, can it flow that high/low for the reach?

Assign Quality Codes to the Flow data

Refer to NEMS 2016 Ratings for QC; default QC is that of the underlying Water Level data

Copy data to the final site file
<Sitename>

Data copied to the Final site file are:
- Flow (i.e. ratings) covering period of Water Level processing (NOTE: Rating start time may begin before Water Level data in batch)
- Gaugings Results, Hydrometric Gauging & Facecard for each gauging used for ratings
- Cross Sections

Copy final site file to the **Provisional Archive NEMS V1**
<Sitename>

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4. Water Level Processing Register
5. Plots: Drift over time and Reference Checks over range
6. Batch Comments : Archive & Processing Comments
7. Flow Plot
8. Ratings Curve
9. Qrate
10. NCRs
11. Surveys: Datum Continuity table