\\Ares\Environmental Data Validation\Turbidity\Turbidity (ISO)\

Logsheet Loader

Processing Period and Batch Number

Check Hydrometric and Provisional Archive

Chits: Last inspection previous batch – latest inspection

Check all chits present/correct

Batch folder: Copy in Docs and label batch #

Create new Hilltop file (*batch#.hts*) in batch folder

Hilltop <SiteName>_Raw file
\\ares\Original\Hilltop Telemetry\<SiteCode>.hts
or \\ares\Original\Internal\<SiteCode>.hts

Raw Turbidity (ISO)
Site Code_Raw

Check data from: 1) Archive: Water Quality (keep QC) 2) Archive: Sampler Provisional and QC these inspections as 200

Collate the Processing Information

Load Inspections Check data, "Null" for inspections with no check data (main inspection time); load any comments applicable to the data source.
Non-detect inspections used to indicate when staff are on site (and potential changes made to code/logger, the data source… etc)

WL and flow from Hydrometric Archive then Provisional Archive

Turbidity (EPA) Backup

Logger code and Signature

Turbidity and Sediment from Archive: Water Quality (should have a QC), Archive: Sampler Provisional (QC 200)

1/7/2014 Do not adjust SOE results which are not to the 15 minute punch (conflict/additional data to what is stored within WQ Archive: Hilltop is left to interpolate) Standard Hydro practice is to the punch.

Pump/Flow meter information, verify Turb (EPA) [Take with grain of salt]

CDT BETA
Check any Non-Conformance for any pertinent information to the site and attach to the processing batch

Field Inspections
- Photocopy Inspection Chits
- Check Logsheet Loader and field inspection chits are correct

Copy raw Turbidity (ISO) and Turbidity (EPA) to **Working** file

Run spike/gap filter – Hidden Gap Marker

Load check data from Logsheet Loader into Turb ISO

Clean Turbidity (EPA) remove for when pump is not running, QC all data as 350 (cautionary/unverified)

Run Virtual Measurements and transform into different sites (therefore always copying in original as VMs adjust with as you adjust your data)

1hr median filter – transform and QC 600

3hr minima VM – transform and QC 500 → Working_min3hr

6hr minima VM – transform and QC 400 → Working_min6hr

12hr minima VM – transform and QC 300 → Working_min12hr

Editing the data

Copy good information to **Corrected** → Comment in Audit Trail/Comment Sheet all adjustments as made

Copy to **Ramped** ← Ramped is where synthetic: backup data (Turbidity EPA) is transformed to ISO, QC 350.
Cleaning at inspection, is ramped down due to bio-fouling QC 400.

Copy to **Synthetic** → Comment in Synthetic gaps/why where applicable – QC 100 any gaps which cannot be filled

Is there synthetic data?

Yes: Copy in Synthetic Data and QC

No: Leave gaps and file ready to fill when synthetic record has been generated → This leaves gaps to fill for Synthetic record when it has been generated from the clean data

Copy data to final file
Site Code

Quality Code data (including check data)

Copy to the **Provisional Archive**

Update Logsheet Loader/CDT

Finish paper work and submit for Review

Print off to hand in:
1. URF
2. FDT
3. Processing Register
4. Batch Comments
5. Final Plot + QC
6. Raw/Final/Audit

Also to be included:
7. Turbidity and Sediment samples list from WQ archive
8. Chits with any corrections made on them (and noted on the original chits as well as the logsheet loader)
9. Any relevant non-conformances

Quality Code NEMS - Deviation from validation:

The check/validation samples are indicative of the quality of the data.
From the Register (comparison of point /lab verified samples and in stream continuous data)

Below 20FNU the Absolute Difference between validation and continuous record:
600 < 1 FNU,
1 ≥ 500 < 3 FNU,
400 ≥ 3 FNU

Above 20FNU –the Relative Difference between validation and continuous record:
600 ≤ 5% ,
5% > 500 < 15%
400 ≥ 15%

550 Adjustments used to less 3 hours
500 3hr min low pass filter, 1hr median filter (less 750 FNU on a recession
400 6hr min low pass filter, Ramp correction for upward biofouling
350 Synthetic: Backup – Turbidity (EPA)
300 12hr min low pass filter, Synthetic Record
200 Synthetic – gaps awaiting insert when synthetic record generated (3years continuous record to generate)
100 Missing Record

Quality Code Validation/Check data

600: All good
500: Not taken at sensor, i.e. SOE site samples which differ from Hydro sites
400: Cautionary Data + comment in comment sheet/audit trail
200: Cautionary Unverified (Autosampler samples)
100: Missing - no validation/check sample taken, but site inspection has been logged (indicate when on site)

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Logsheet Loader

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Hilltop <SiteName>_Raw file
\\ares\Original\...\<SiteCode>.hts

Check data from: 1) Archive: Water Quality (keep QC) 2) Archive: Sampler Provisional and QC these inspections as 200

Raw Turbidity (ISO)
Site Code_Raw

Load Inspections Check data, "Null" for inspections with no check data (main inspection time); load any comments applicable to the data source.
Non-detect inspections used to indicate when staff are on site (and potential changes made to code/logger, the data source… etc)

Collate the Processing Information

Water Level and Flow for site (if available)

Turbidity and Sediment from Archive:
Water Quality (should have a QC),
Archive: Sampler Provisional (QC 200)

Logsheet Loader
Check any Non-Conformance for any pertinent information to the site and attach to the processing batch

Field Inspections
- Photocopy Inspection Chits – can be found: \\ares\Hydrology\Water Quality Sites\Lake Sampling SOE's\
- If no digital file of form saved yet, find hard copy and scan & save accordingly
- Check Logsheet Loader and field inspection chits are correct
- Verify WQ samples and times (esp AS Runs and remove DI)

Copy raw Turbidity (ISO) and Turbidity Backup to **Working** file

Run spike/gap filter – Hidden Gap Marker

Load check data from Logsheet Loader into Turb ISO

Editing the data

Conservative Editing of Lake Turbidity Data:
- Remove spikes that are outside of the sensor range
- Remove spikes that coincide with spikes in other data sources at the site
- Remove spikes associated with hourly cleaning of the sensor
- No smoothing of the data (decision made 16/08/2016)
- Fouling corrections (i.e. ramp to after clean) acceptable if plenty of evidence.

When processing this datasource things to consider:
- processing is considered within the context of all the data sources recorded at the buoy - blue-green algae, Cholorophyll A, pH and Conductivity - weed growth - affects turbidity/ weed and particles suspended in the lake column.
- high turb- indicative of algael blooms on the lake
- Dissolved Oxygen down + cholorophyll up - sediment source
- rainfall and wind from surrounding sites copied in and considered
- Sensor (for all data sources) cleans itself once every hour; brush goes around sensors x2 clockwise, x2 anticlockwise
- Summer months beware of fish eggs causing inaccurate readings; can build up a layer, causing sensor to read consisting high/low
- Refer to a couple of articles/presentations in Hydro Reference Library

Quality Code data (including check data)

Quality Code NEMS - Deviation from validation:

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Above 20FNU –the Relative Difference between validation and continuous record:
600 ≤ 5% ,
5% > 500 < 15%
400 ≥ 15%

550 Adjustments/ edits ≤ 1 hours – with comment
400 Ramp correction for biofouling – with comment
200 Suspect/Cautionary data – with comment
100 Missing Record (> 1 hour) – with comment

Copy data to final file
Site Code

Copy to the **Provisional Archive**

Update Logsheet Loader/CDT

Print off to hand in:
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2. FDT
3. Processing Register (not entire, just for period of processing)
4. Batch Comments
5. Final Plot + QC
6. Raw/Final/Audit
7. Chits/Field inspections