

Monitoring stations: schedule and sampling intervals

Water quality programme · Schedule current at 1 February 2026

The schedule below lists the fixed stations sampled under the water quality programme. Stations are visited in the order shown wherever the tide allows. Depths are metres below lowest astronomical tide as recorded at installation, and are not corrected for later change.

The programme

The water quality programme has run in its present form since 2011, when the first two stations were established at Vardenne Quay and Thrimby Point. There are now twenty-two, the most recent added in November 2025. The programme provides the baseline against which any change at Kellow Sands is measured, and it is the only continuous record of salinity in the upper estuary. Sampling is carried out by the Partnership's own staff, with the Vellamy Society providing cover during August.

Analysis is carried out under contract by Kirkhollow Analytical Laboratories. The determinations are those set by the 2015 programme review: suspended solids, chloride, ammoniacal nitrogen, oxidised nitrogen, orthophosphate and dissolved organic carbon, with particle size on the intertidal stations twice a year.

Sampling

Samples are taken from a boat at the deep stations and by wading at the intertidal ones, in each case on the ebb and within two hours of high water. Where a station cannot be reached on the day it is due it is taken as soon afterwards as conditions allow, and the actual date is recorded: the schedule is a plan and not a record. Stations on a weekly interval are the exception, and a missed week there is reported to the Board.

Field measurements of temperature and dissolved oxygen are taken at every visit, entered in the field book, and transcribed into the station record within the week. Bottles are delivered to Braithe Road the same day wherever the round permits, and are held in the refrigerated drop box overnight when it does not.

The stations

Grid references are to the nearest ten metres and describe the position of the marker, not of the sampling point, which at the intertidal stations is up to five metres seaward of it. Two stations are sampled quarterly rather than monthly; both were added to answer a particular question about the southern creeks, and both are due for review in 2027.

Access is by public footpath at every station except Marnhead Deep and Tarbert Jetty, both of which need the harbour master's permission and a crew of two. The Partnership's insurance covers wading only where a second person is on the shore, and staff are asked not to work the intertidal stations single-handed even where the access itself is straightforward.

Reporting

Results are entered in the station record within a week of the report arriving from the laboratory, and the record is closed for the quarter at the end of the following month. A late result is entered with the date it arrived as well as the date of sampling, because the two have diverged by as much as five weeks where the laboratory has had to repeat a batch.

The quarterly summary goes to the Board and to the Harbour Board, and an annual summary is published. Neither includes the field measurements, which are held in the station record and are available to anyone who asks the secretariat for them.

Changes to the schedule

A station is added or withdrawn only by a decision of the Board, on a recommendation from the secretariat, and the reason is minuted. The programme has lost three stations since 2011: two at the head of Kellow Creek, which dried out after the storms of 2014, and one at the bar, which could not be reached safely often enough to be worth keeping.

A change to a sampling interval does not need a Board decision and is made by the secretariat where the tide or the staffing requires it. Every such change is listed in the quarterly summary. Two stations moved from monthly to quarterly in 2024 for that reason and both are due to be reviewed.

Equipment

Field measurements are taken with two hand-held meters, both serviced annually under contract and both calibrated against the same standards before each round. The meters are identified in the station record by serial number, because a drift on one of them in 2022 was traced only because the record said which meter had been used.

The boat is the Partnership's own and is kept at the boatyard. It carries no sampling equipment of its own: everything goes aboard for the round and comes off afterwards, which is slower but has stopped bottles being left in the sun.

Health and safety

Every station has a written access note, and the notes are reviewed each January. Two stations need a permit and a crew of two; three are on soft ground where a wading pole is carried; and one, at the training wall, is worked only on a falling tide and never alone. The notes are in the boat's folder and in the office copy of this schedule.

Staff working the intertidal stations carry a radio and tell the office which round they intend to work and when they expect to be off the flats. The office rings the duty officer if a party has not reported in within an hour of that time. The arrangement has been tested twice and worked on both occasions.

The record

The station record is a spreadsheet held on the Partnership's own drive, with a copy taken monthly and held by the Harbour Board. It carries one row per visit: the station, the date, the time, the state of the tide, the field measurements, the laboratory reference and the results when they arrive. Nothing is overwritten. A corrected value is entered as a new row with a note, and the original stays where it was.

The record goes back to March 2011 for the original stations and to the month of installation for the rest. The first two years are less complete than the Partnership would like: the state of the tide was not recorded at all until 2013, and there is a gap of eleven weeks in the winter of 2012 when the meter was away for repair.

The 2015 review

The programme was reviewed in 2015 by a panel of three, one of them from outside the estuary, and the review is worth reading before any change is proposed. Its main recommendation, that the number of determinations be cut and the number of visits kept, was accepted; the programme has been cheaper and more useful since. Its second recommendation, that the Partnership publish the data as it is collected rather than annually, has not been implemented and is raised at most Board meetings.

The panel also recommended that two stations be moved: one at the head of Kellow Creek, which was moved forty metres seaward in 2016, and one at the bar, which was withdrawn instead. The reasons for withdrawing rather than moving it are in the minute of that meeting and are still sound.

Access to the data

The record is available to Partnership members on request and to anyone else at the secretariat's discretion, which in practice means that a request from a school, a consultant or a neighbour is met, and that a request with no reason given is asked for one. There is no charge for a copy of the record; there is a charge for the secretariat's time in extracting something particular from it.

The annual summary is published in April and is sent to the parish councils, the wildlife trust and the two angling clubs. It carries the means and the ranges by station and by quarter rather than the individual results, which is a decision of the Board and not a limitation of the record.

Costs

The programme costs about nineteen thousand pounds a year, of which the laboratory's charges are rather more than half and the rest is staff time, the boat and the meters. The Partnership meets two thirds and the Harbour Board one third under the agreement of 2015, which runs to 2027 and is due to be renegotiated in the coming year.

Determinations

Every visit produces a sample for suspended solids and chloride. Ammoniacal nitrogen and oxidised nitrogen are taken at the twelve stations above the training wall, orthophosphate at the six in the creeks, and dissolved organic carbon at four stations chosen in 2015 to give a spread across the estuary rather than a concentration in one reach.

Particle size is taken twice a year at the intertidal stations and is the one determination the programme has kept against advice. The 2015 panel thought it of little value at this frequency and the Partnership has continued it because the intertidal survey needs a comparison, which is a reason the panel did not have in front of it.

Table 1. Fixed monitoring stations, with grid references and sampling intervals.

Station	Grid reference	Depth (m)	Sampling interval	Installed
Vardenne Quay	NX 4118 6602	2.4	Fortnightly	March 2011
Thrimby Point	NX 4276 6491	1.8	Fortnightly	March 2011
Kellow Sands north	NX 4390 6588	0.9	Monthly	June 2013
Kellow Sands south	NX 4402 6531	1.1	Monthly	June 2013
Marnhead Deep	NX 4025 6714	8.6	Monthly	October 2014
Braithe Bridge	NX 3982 6853	3.2	Weekly	April 2015
Harrowby Reach	NX 4147 6770	4.5	Fortnightly	April 2015
Sandiman Bank	NX 4233 6685	1.3	Monthly	September 2016
Vellamy Creek	NX 4318 6438	0.6	Monthly	September 2016
Tarbert Jetty	NX 4064 6552	2.9	Fortnightly	May 2018
Croyde Gut	NX 4351 6367	1.6	Quarterly	May 2018
Prosser Flats	NX 4189 6304	0.7	Quarterly	August 2020
Old Lifeboat House	NX 4295 6620	1.9	Fortnightly	August 2020
Training Wall east	NX 4126 6459	5.4	Weekly	February 2023
Lissamer Point	NX 4208 6742	3.7	Monthly	February 2023
Kellow Creek head	NX 4436 6612	0.4	Quarterly	March 2024
Vardenne Outfall	NX 4102 6571	2.1	Weekly	March 2024
Marnhead Bar	NX 3968 6741	9.3	Monthly	September 2024

Table 1 (continued)

Station	Grid reference	Depth (m)	Sampling interval	Installed
Thrimby Spit	NX 4301 6467	1.4	Fortnightly	September 2024
Harrowby Cut	NX 4163 6799	5.8	Monthly	April 2025
Boatyard Steps	NX 4088 6588	1.2	Fortnightly	April 2025
Cavenshaw Bight	NX 4372 6521	2.6	Quarterly	November 2025

Croyde Gut and Prosser Flats are sampled in the first week of February, May, August and November. Stations withdrawn before 2011 are listed in the programme review of that year.

A station is sampled on the interval shown or better. Where a visit is missed the record says so and the next visit is not brought forward to compensate, because a shortened interval is harder to allow for later than a missing week.