ROYAL HASKONING

Cell 1 Regional Coastal Monitoring Programme
Analytical Report 3: 'Full Measures' Survey 2010

NORTHUMBERLAND
Northumberland County Council

Northumberland County Council
Final Report

December 2010

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Abbreviations and Acronyms

Acronym / Abbreviation	Definition
AONB	Area of Outstanding Natural Beauty
DGM	Digital Ground Model
HAT	Highest Astronomical Tide
LAT	Lowest Astronomical Tide
m	metres
MHWN	Mean High Water Neap
MHWS	Mean High Water Spring
MLWN	Mean Low Water Neap
MLWS	Mean Low Water Spring
MSL	Mean Sea Level
ODN	Ordnance Datum Newlyn

Water Levels Used in Interpretation of Changes

Water Level Parameter	Water Level (mODN)		
	Berwick upon Tweed	Holy Island	North Sunderland
1 in 200 year	3.4	3.4	3.5
HAT	2.8	2.8	2.8
MHWS	2.2	2.4	2.4
MLWS	-1.9	-1.8	-1.7
Water Level Parameter	**Water Level (mODN)**		
	Amble	**Blyth**	**River Tyne**
1 in 200 year	3.5	3.6	3.7
HAT	3.1	3.1	3.1
MHWS	2.4	2.4	2.4
MLWS	-1.9	-1.8	-1.9

Source: *Scottish Border to River Tyne Shoreline Management Plan 2*. Royal Haskoning, May 2009.

Glossary of Terms

Term	Definition
Beach nourishment	Artificial process of replenishing a beach with material from another source.
Berm crest	Ridge of sand or gravel deposited by wave action on the shore just above the normal high water mark.
Breaker zone	Area in the sea where the waves break.
Coastal squeeze	The reduction in habitat area which can arise if the natural landward migration of a habitat under sea level rise is prevented by the fixing of the high water mark, e.g. a sea wall.
Downdrift	Direction of alongshore movement of beach materials.
Ebb-tide	The falling tide, part of the tidal cycle between high water and the next low water.
Fetch	Length of water over which a given wind has blown that determines the size of the waves produced.
Flood-tide	Rising tide, part of the tidal cycle between low water and the next high water.
Foreshore	Zone between the high water and low water marks, also known as the intertidal zone.
Geomorphology	The branch of physical geography/geology which deals with the form of the Earth, the general configuration of its surface, the distribution of the land, water, etc.
Groyne	Shore protection structure built perpendicular to the shore; designed to trap sediment.
Mean High Water (MHW)	The average of all high waters observed over a sufficiently long period.
Mean Low Water (MLW)	The average of all low waters observed over a sufficiently long period.
Mean Sea Level (MSL)	Average height of the sea surface over a 19-year period.
Offshore zone	Extends from the low water mark to a water depth of about 15 m and is permanently covered with water.
Storm surge	A rise in the sea surface on an open coast, resulting from a storm.
Swell	Waves that have travelled out of the area in which they were generated.
Tidal prism	The volume of water within the estuary between the level of high and low tide, typically taken for mean spring tides.
Tide	Periodic rising and falling of large bodies of water resulting from the gravitational attraction of the moon and sun acting on the rotating earth.
Topography	Configuration of a surface including its relief and the position of its natural and man-made features.
Transgression	The landward movement of the shoreline in response to a rise in relative sea level.
Updrift	Direction opposite to the predominant movement of longshore transport.
Wave direction	Direction from which a wave approaches.
Wave refraction	Process by which the direction of approach of a wave changes as it moves into shallow water.

Preamble

The Northumbrian Coastal Authorities Group (NCAG[1]) Monitoring Programme began in April 2002 with a survey of profile lines along various sections of the coastline between Berwick-upon-Tweed and the River Tyne. These were fully repeated in September 2002 and since then annual surveys of all profiles have been undertaken as a 'Full Measures' survey in autumn/early winter every year. Some of these surveys are then repeated the following spring as part of a 'Partial Measures' survey.

At various times, additional beach profile lines have been added and topographic surveys at Holy Island, Alnmouth, Sandstell Point and Newbiggin Bay, and cliff top surveys at Newbiggin Caravan Park, Sandy Bay Caravan Park and Cambois Bay have been introduced.

In September 2008 the monitoring became incorporated within the wider Cell 1 Regional Coastal Monitoring Programme. This covers approximately 300km of the north east coastline, from the Scottish Border (just south of St. Abb's Head) to Flamborough Head in East Yorkshire. This coastline is often referred to as 'Coastal Sediment Cell 1' in England and Wales (Figure 1). Within this frontage the coastal landforms vary considerably, comprising low-lying tidal flats with fringing salt marshes, hard rock cliffs that are mantled with glacial till to varying thicknesses, softer rock cliffs, and extensive landslide complexes.

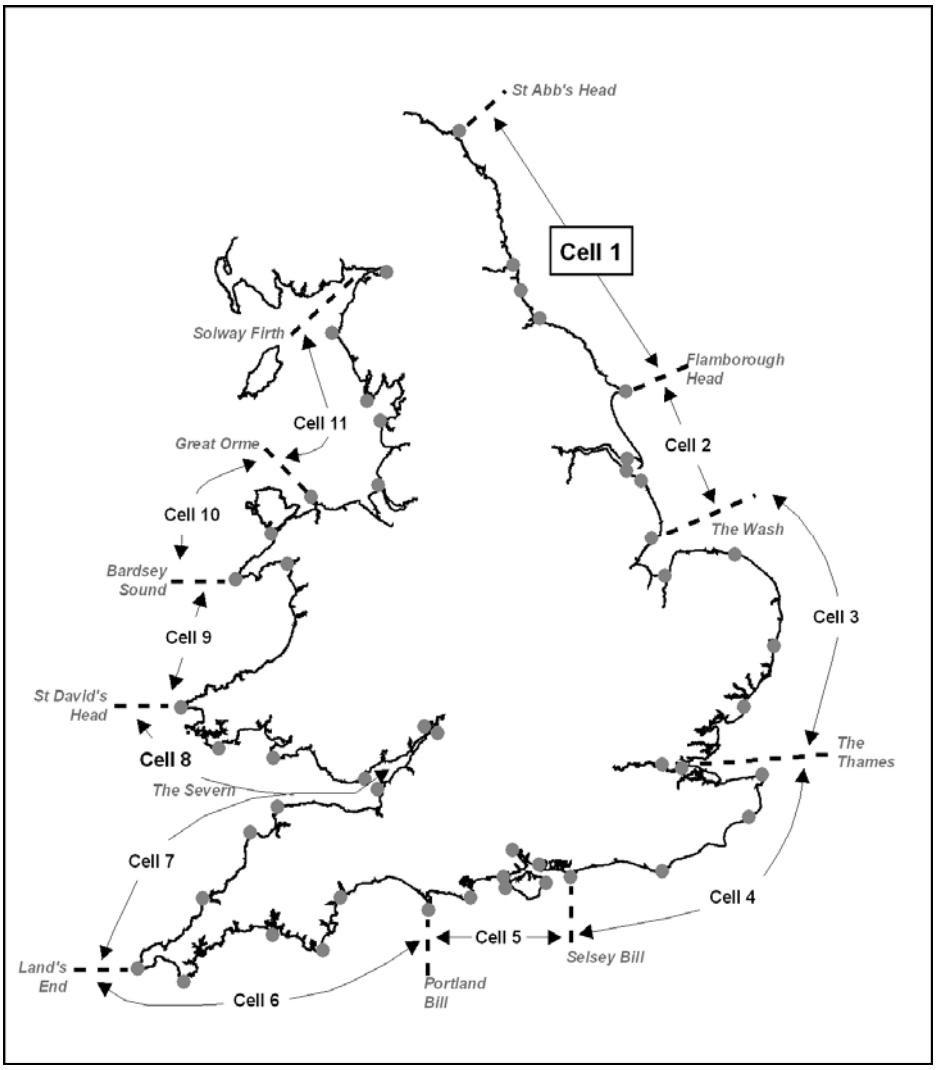


Figure 1 Sediment Cells in England and Wales

[1] NCAG become part of the wider North East Coastal Group (NECG) in September 2008.

The Cell 1 programme commenced in its present guise in September 2008 and is managed by Scarborough Borough Council on behalf of the North East Coastal Group. It is funded by the Environment Agency, working in partnership with the following organisations.

The data collection, analysis and reporting is being undertaken as a partnership between the following organisations:

The main elements of the Cell 1 Regional Coastal Monitoring Programme involve:

- beach profile surveys (as before for Northumberland)
- topographic surveys (as before for Northumberland)
- cliff top recession surveys (as before for Northumberland)
- real-time wave data collection
- bathymetric and sea bed characterisation surveys south of the River Tyne
- aerial photography
- walk-over surveys

The beach profile surveys, topographic surveys and cliff top recession surveys are undertaken as a 'Full Measures' survey in autumn/early winter every year. Some of these surveys are then repeated the following spring as part of a 'Partial Measures' survey.

Each year, an Analytical Report is produced for each individual authority, providing a detailed analysis and interpretation of the 'Full Measures' surveys.

This is followed by a brief Update Report for each individual authority, providing ongoing findings from the 'Partial Measures' surveys.

A Cell 1 Overview Report will also be produced periodically. This will provide a region-wide summary of the main findings relating to trends and interactions along the entire Cell 1 frontage within distinct time phases of the programme, defined by specific funding allocations. The first such report is expected to be produced in spring 2011 (covering 2008 – 2011) when the initial three year funding allocation comes towards an end.

To date the following reports have been produced since incorporation within the Cell 1 Regional Coastal Monitoring Programme:

Table 1 Analytical, Update and Overview Reports Produced to Date

Year		Full Measures		Partial Measures		Cell 1 Overview Report
		Survey	Analytical Report	Survey	Update Report	
1	2008/09	Sep-Dec 08	June 09 (^)	Mar 09	June 09	-
2	2009/10	Sep-Nov 09	Mar 10	Mar-Apr 10	June 10	-
3	2010/11	Sep-Nov 10	Dec 10(*)			

(^) Combined report for Northumberland County Council and North Tyneside Council; subsequent reports have been separate.

(*) The present report is **Analytical Report 3** and provides an analysis of the 2010 Full Measures survey for Northumberland County Council's frontage.

In addition, separate reports are produced for other elements of the programme as and when specific components are undertaken, such as wave data collection, bathymetric and sea bed sediment data collection, aerial photography, and walk-over visual inspections.

For purposes of analysis, the Cell 1 frontage has been split into the sub-sections listed in the Table 2.

Table 2 Sub-divisions of the Cell 1 Coastline

Authority	Zone
Northumberland County Council	Sandstell Point
	Spittal
	Goswick Sands
	Holy Island
	Bamburgh
	Beadnell Village
	Beadnell Bay
	Embelton Bay
	Boulmer
	Alnmouth Bay
	High Hauxley and Druridge Bay
	Lynemouth Bay
	Newbiggin-by-the-Sea
	Cambois Bay
	Blyth South Beach
North Tyneside Council	Whitley Sands
	Cullercoats Bay
	Tynemouth Long Sands
	King Edward's Bay
South Tyneside Council	Littehaven Beach
	Herd Sands
	Trow Quarry (incl. Frenchman's Bay)
	Marsden Bay
Sunderland Council	Whitburn Bay
	Harbour and Docks
	Hendon to Ryhope (incl. Halliwell Banks)
Durham County Council	Featherbed Rocks
	Seaham
	Blast Beach
	Hawthorn Hive
	Blackhall Colliery
Hartlepool Borough Council	North Sands
	Headland
	Middleton
	Hartlepool Bay
Redcar & Cleveland Borough Council	Coatham Sands
	Redcar Sands
	Marske Sands
	Saltburn Sands
	Cattersty Sands (Skinningrove)
Scarborough Borough Council	Staithes
	Runswick Bay
	Sandsend Beach, Upgang Beach and Whitby Sands
	Robin Hood's Bay
	Scarborough North Bay
	Scarborough South Bay
	Cayton Bay
	Filey Bay

1. Introduction

1.1 Study Area

Northumberland County Council's frontage extends from the Scottish Border in the north to Hartley in the south. For the purposes of this report, it has been sub-divided into fifteen areas, namely:

- Sandstell Point
- Spittal
- Goswick Sands
- Holy Island
- Bamburgh
- Beadnell Village
- Beadnell Bay
- Embleton Bay
- Boulmer
- Alnmouth Bay
- Hauxley & Druridge Bay
- Lynemouth Bay
- Newbiggin-by-the-Sea
- Cambois
- Blyth South Beach

1.2 Methodology

Along Northumberland County Council's frontage, the following surveying is undertaken:

- Full Measures survey annually each autumn/early winter comprising:
    - Beach profile surveys along 88 no. transect lines (78 no. since April 2002, with 10 no. added since Full Measures 2007)
    - Topographic survey along Holy Island (since Full Measures 2004)
    - Topographic survey along Alnmouth Bay (since Partial Measures 2005)
    - Topographic survey along Sandstell Point (since Full Measures 2009)
    - Topographic survey along Newbiggin Bay (since Full Measures 2010)

- Partial Measures survey annually each spring comprising:
    - Beach profile surveys along 39 no. transect lines (29 no. since April 2002, with 10 no. added since Full Measures 2007)
    - Topographic survey along Alnmouth Bay (since Partial Measures 2005)
    - Topographic survey along Sandstell Point (since Full Measures 2009)
    - Topographic survey along Newbiggin Bay (since Full Measures 2010)

- Cliff top survey (bi-annually) at:
    - Cliff top survey at Newbiggin Caravan Park (since Full Measures 2007)
    - Cliff top survey at Sandy Bay Caravan Park (since Full Measures 2007)
    - Cliff top survey at Cambois (since Partial Measures 2009)

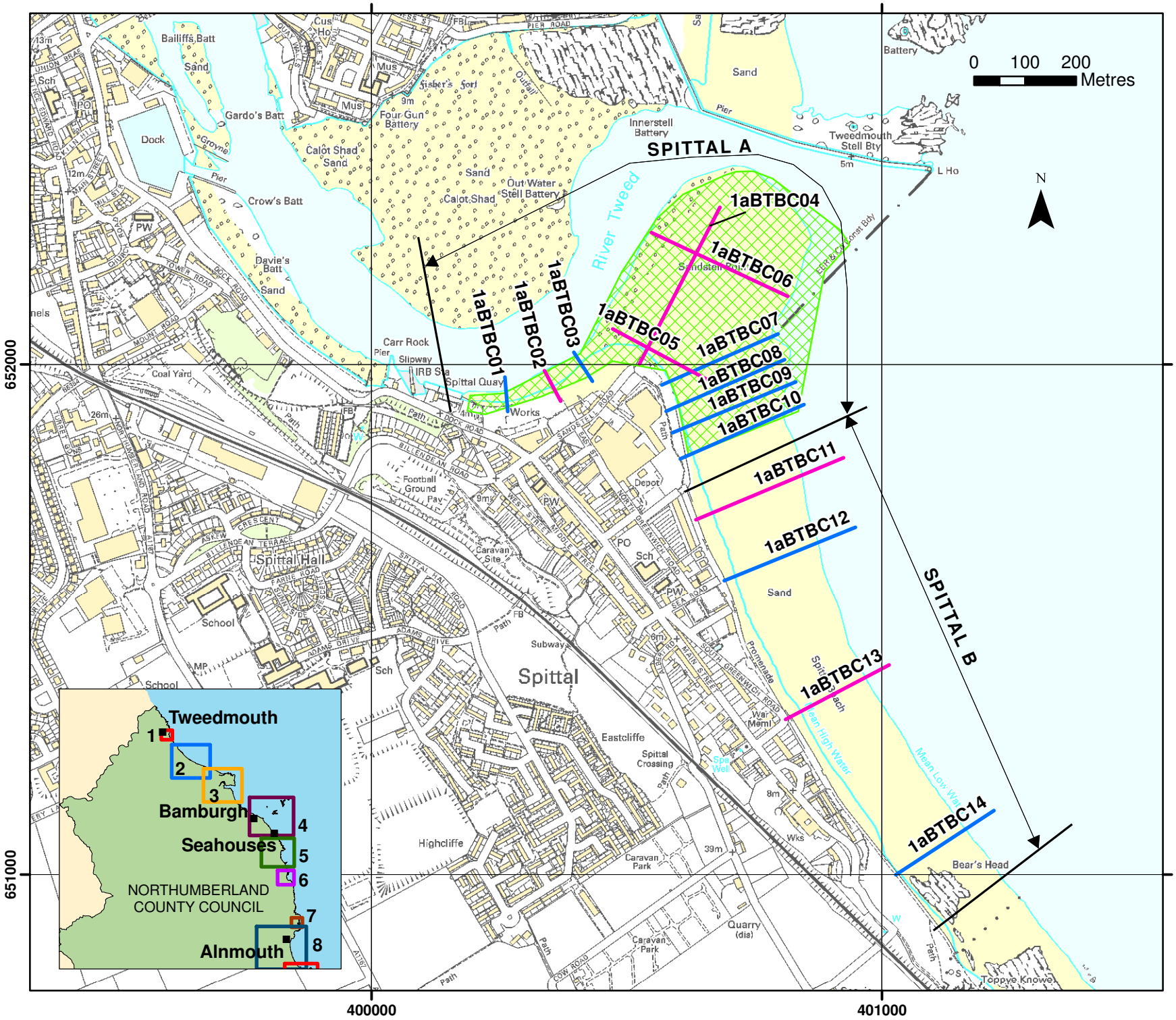
The location of these surveys is shown in Figure 1. They have also previously been provided on a digital file which can be opened in Google Earth showing the locations of the surveys.

The Full Measures survey was undertaken along this frontage over a number of days in August, September, October and November 2010, when weather conditions were generally fine but with the odd foul day and the sea state was mostly calm.

This Analytical Report presents the following:

- description of the changes observed since the previous survey and an interpretation of the drivers of these changes (Section 2);
- documentation of any problems encountered during surveying or uncertainties inherent in the analysis (Section 3);
- recommendations for 'fine-tuning' the programme to enhance its outputs (Section 4); and
- providing key conclusions and highlighting any areas of concern (Section 5).

Data from the present survey are presented in a processed form in the Appendices.



SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 1 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:10,000 at A4

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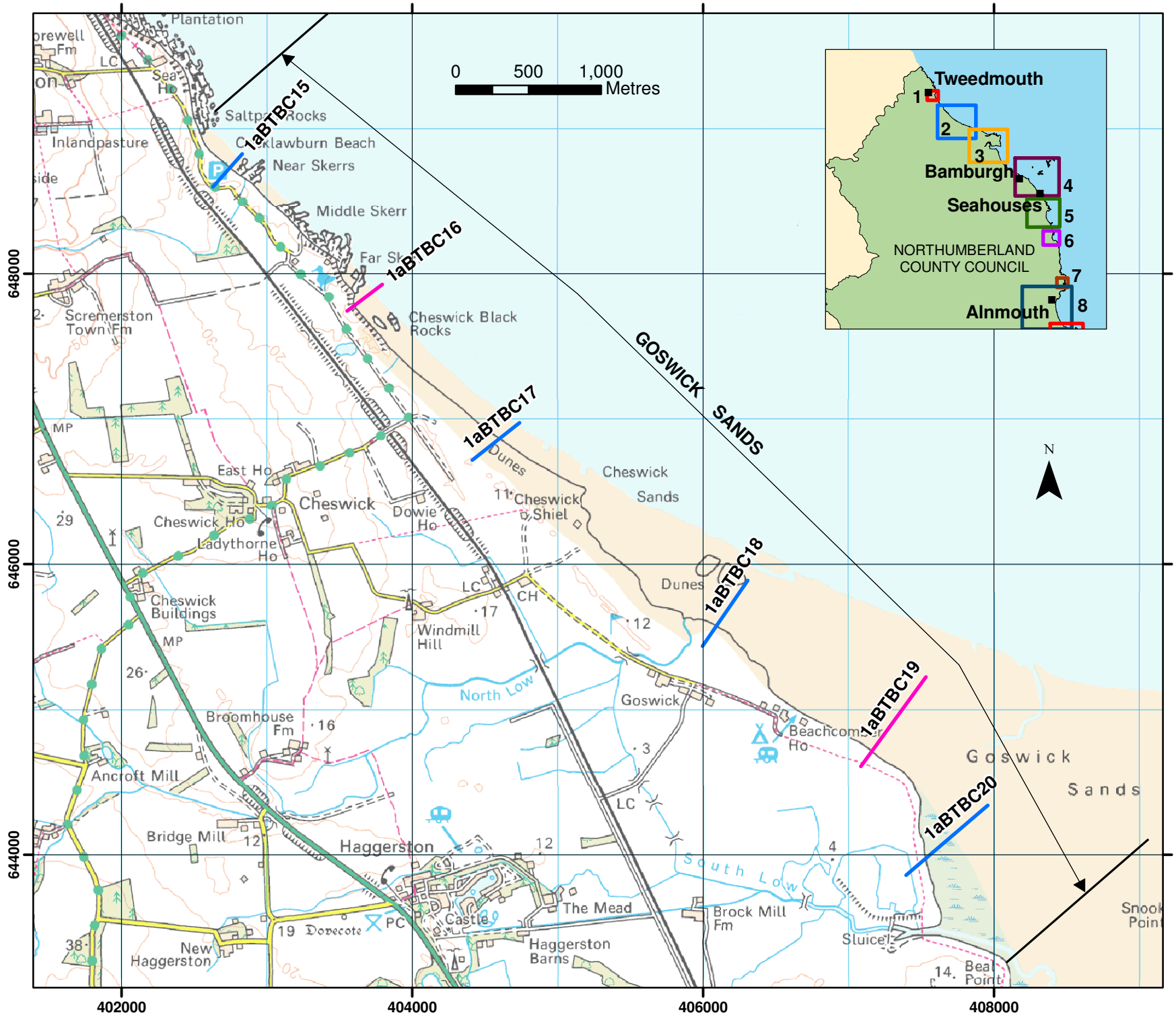

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 2 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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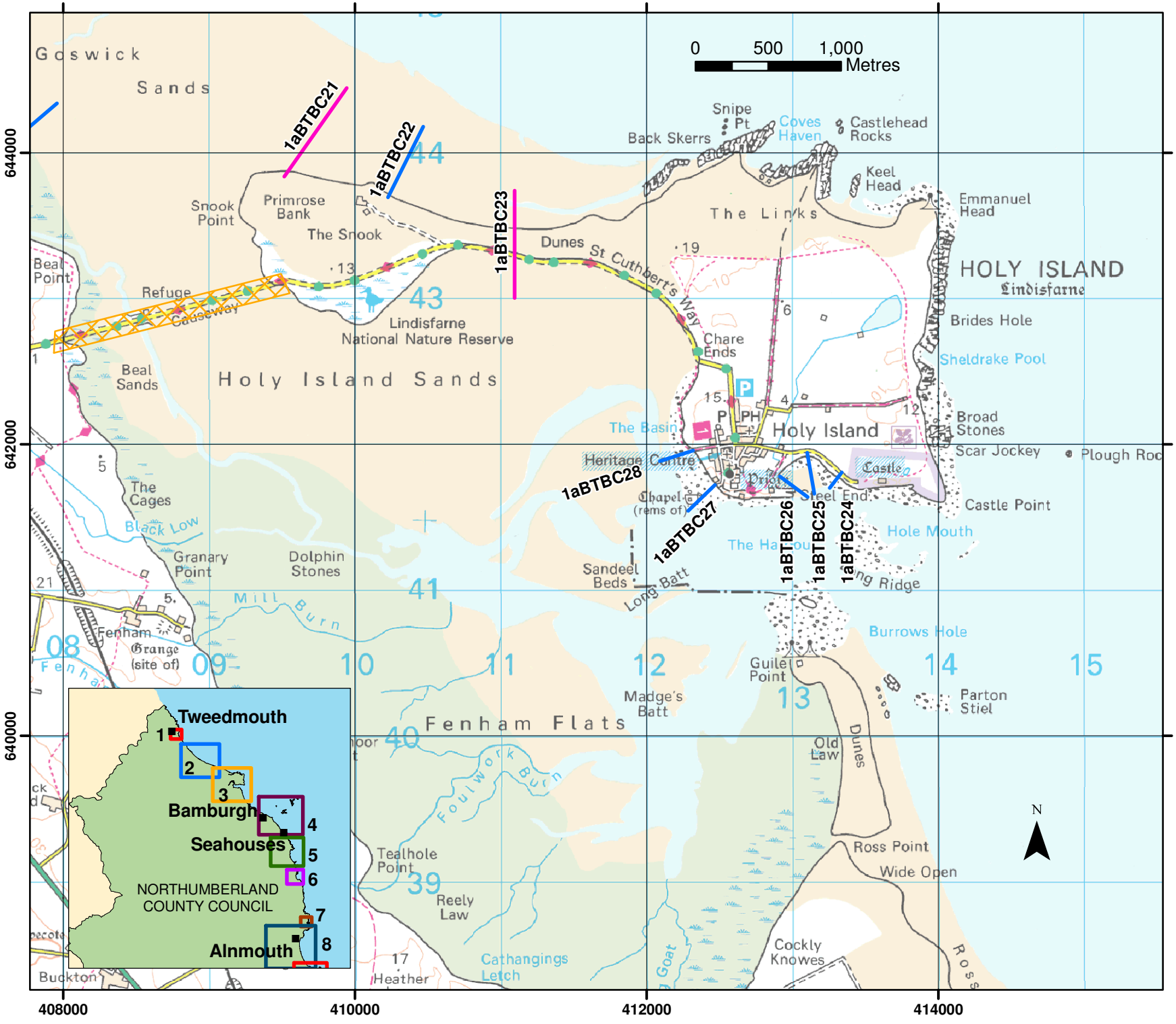

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 3 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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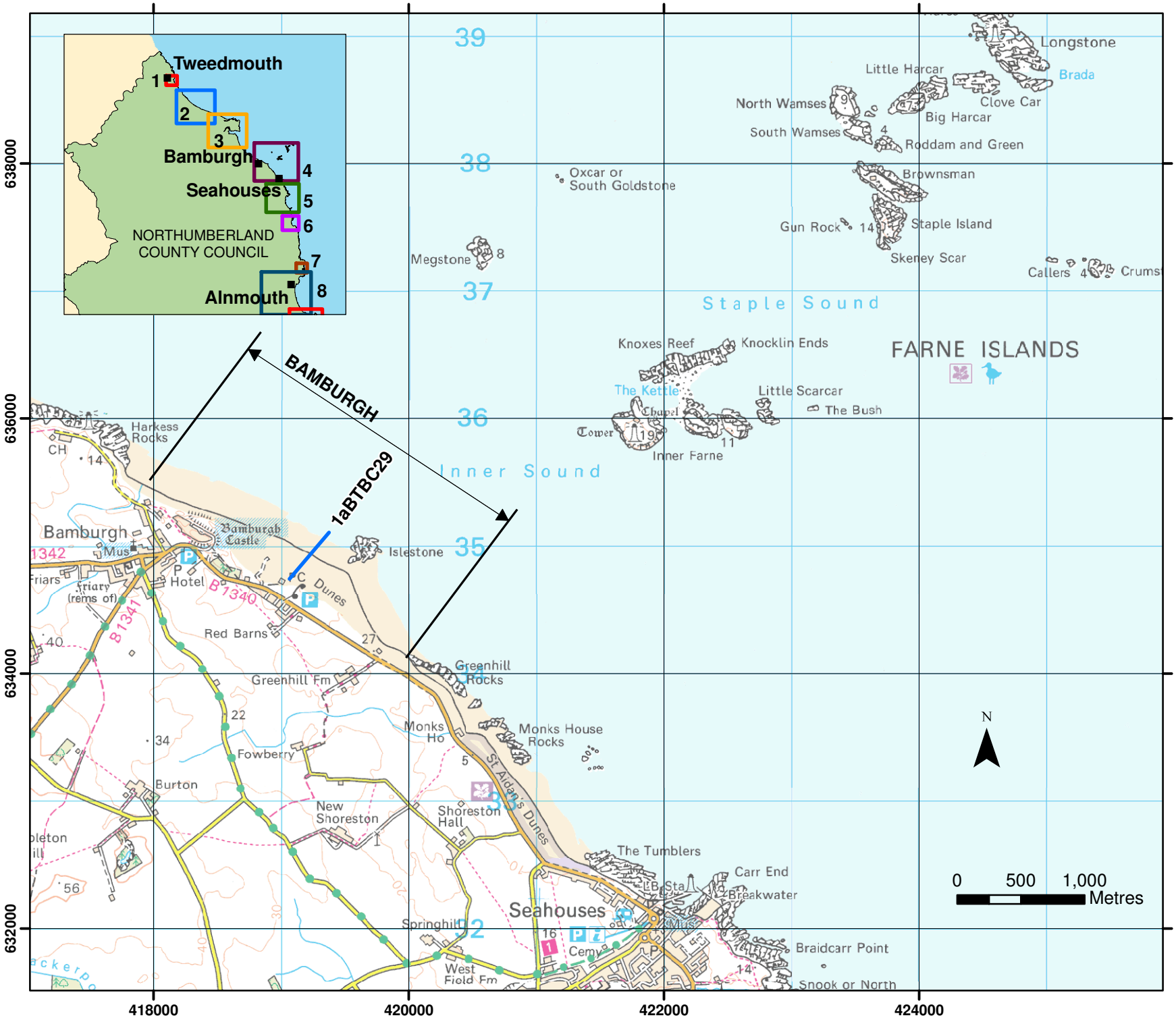

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 4 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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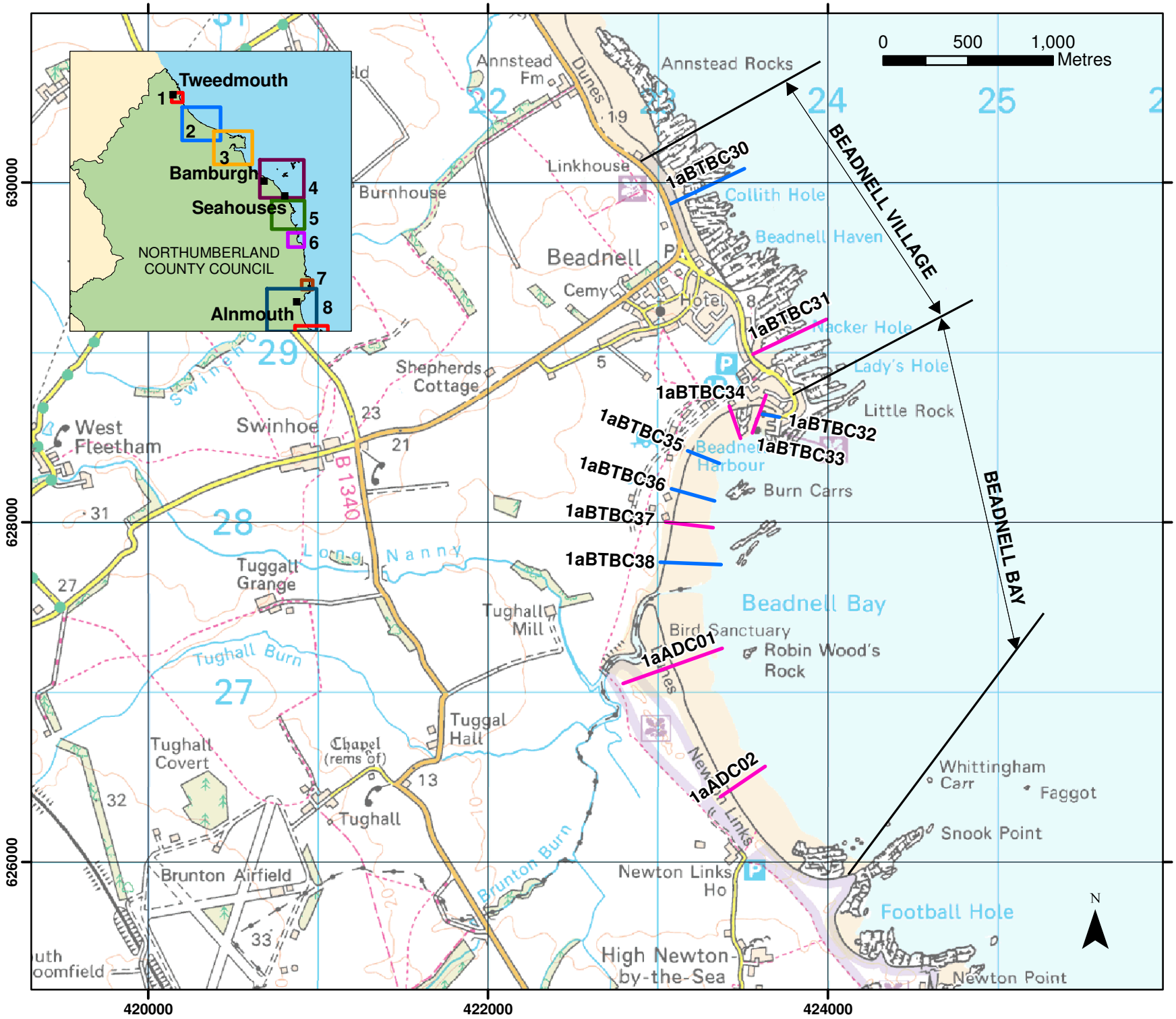

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 5 Northumberland County Council Frontage

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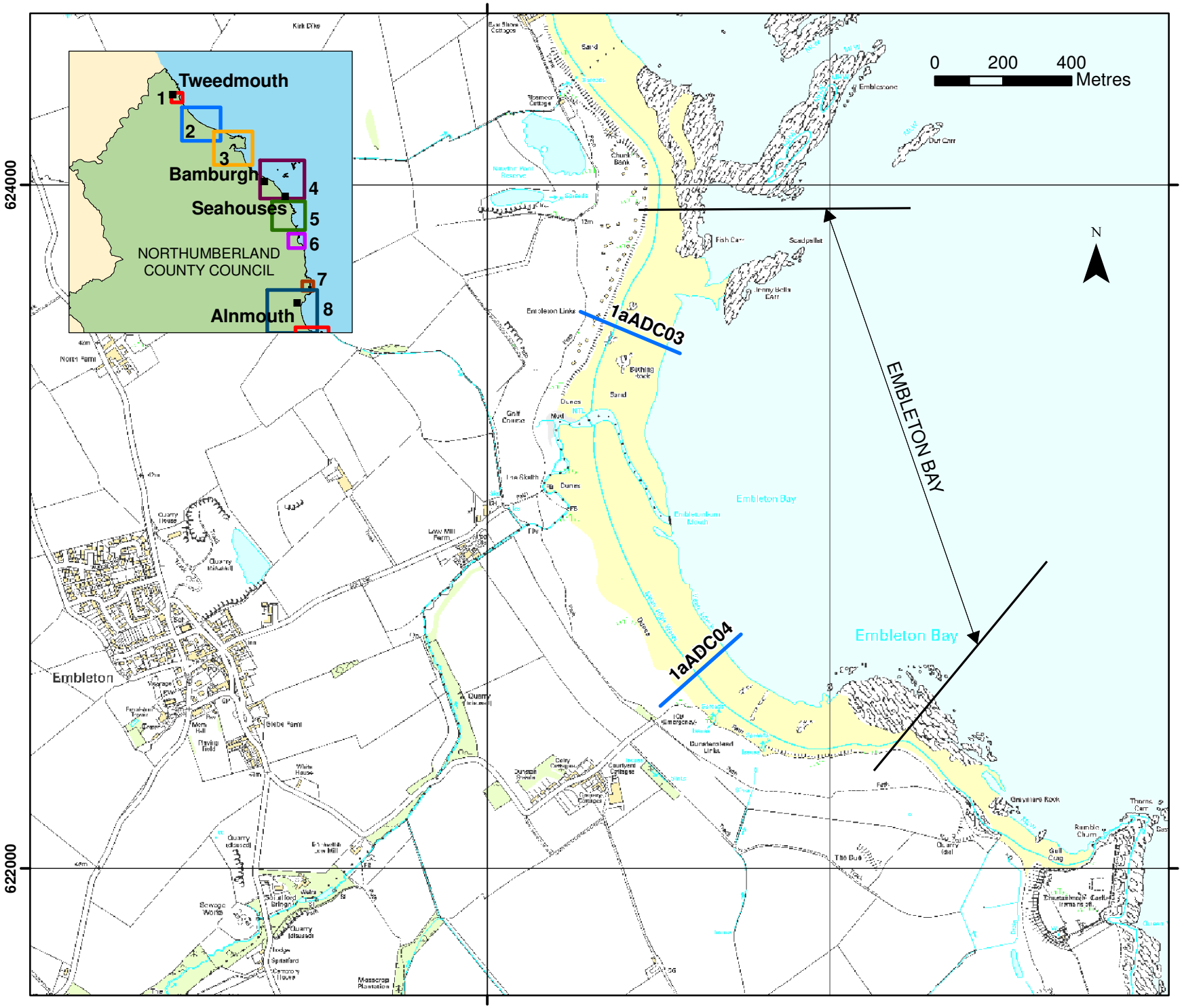

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

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Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 6 Northumberland County Council Frontage

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'Full Measures' Survey 2010

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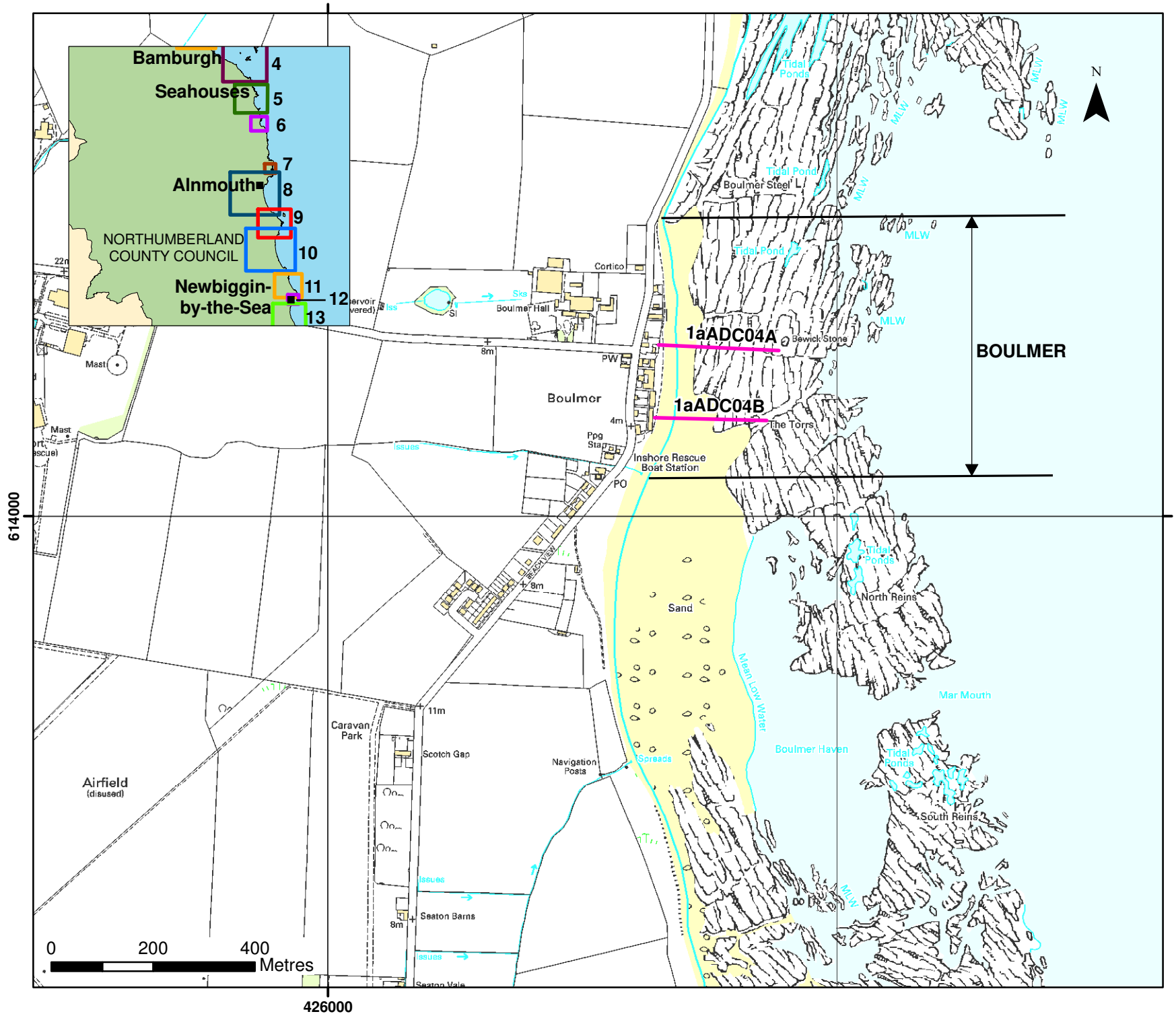

SURVEY LOCATIONS

Topographic Profiles

- Annual
- Bi-Annual

Topographic Surveys

- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

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Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 7 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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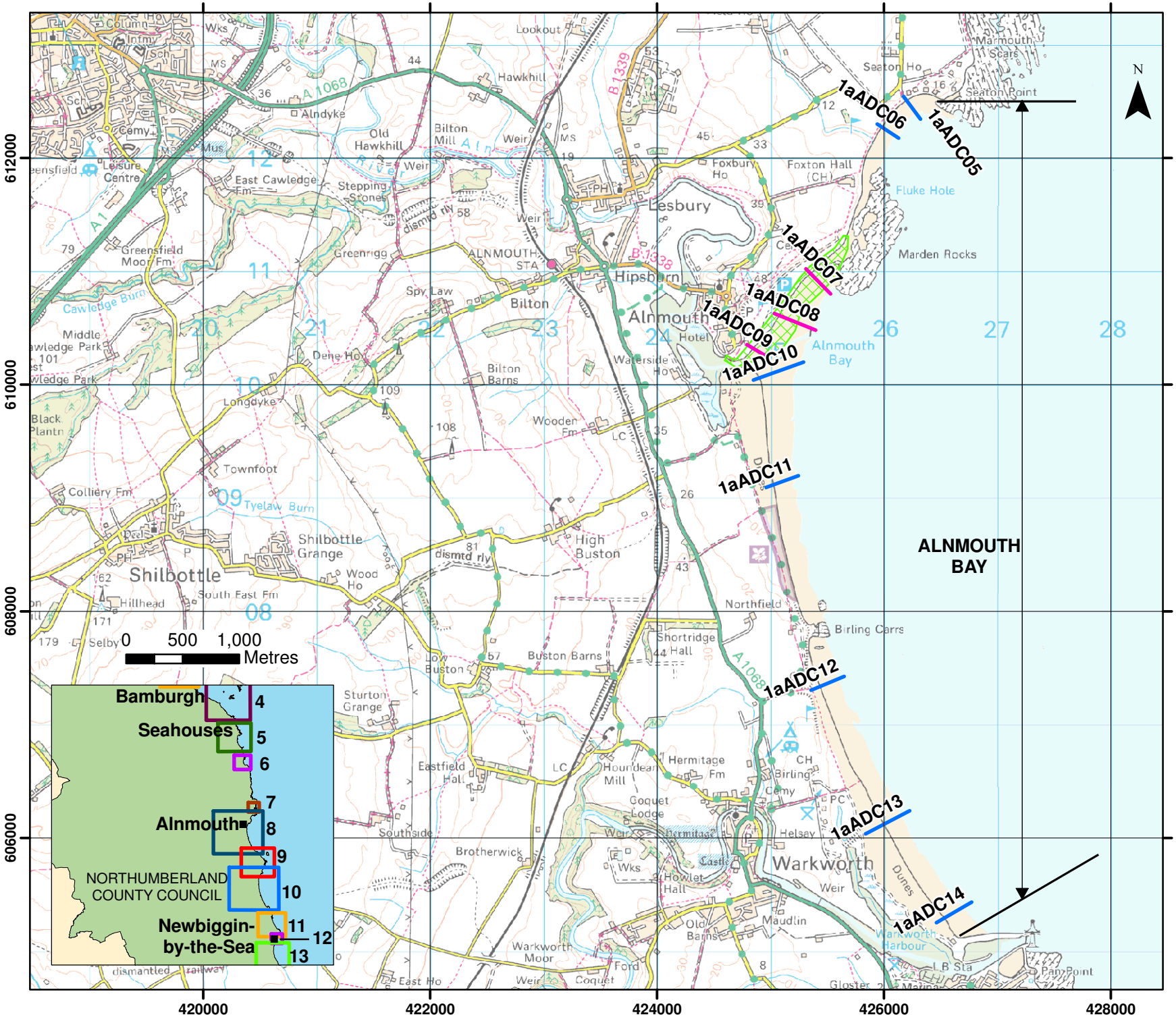

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 8 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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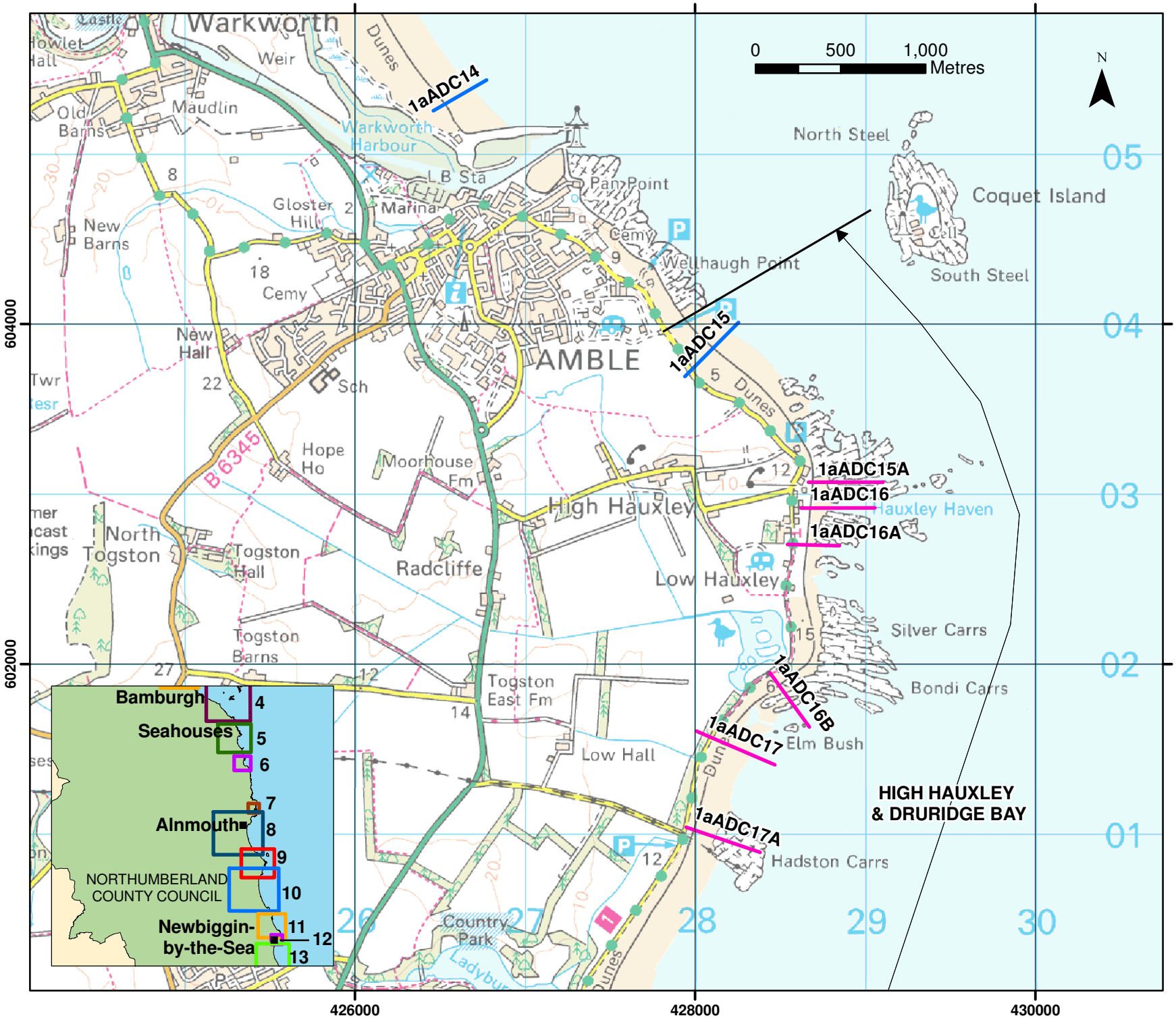

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 9 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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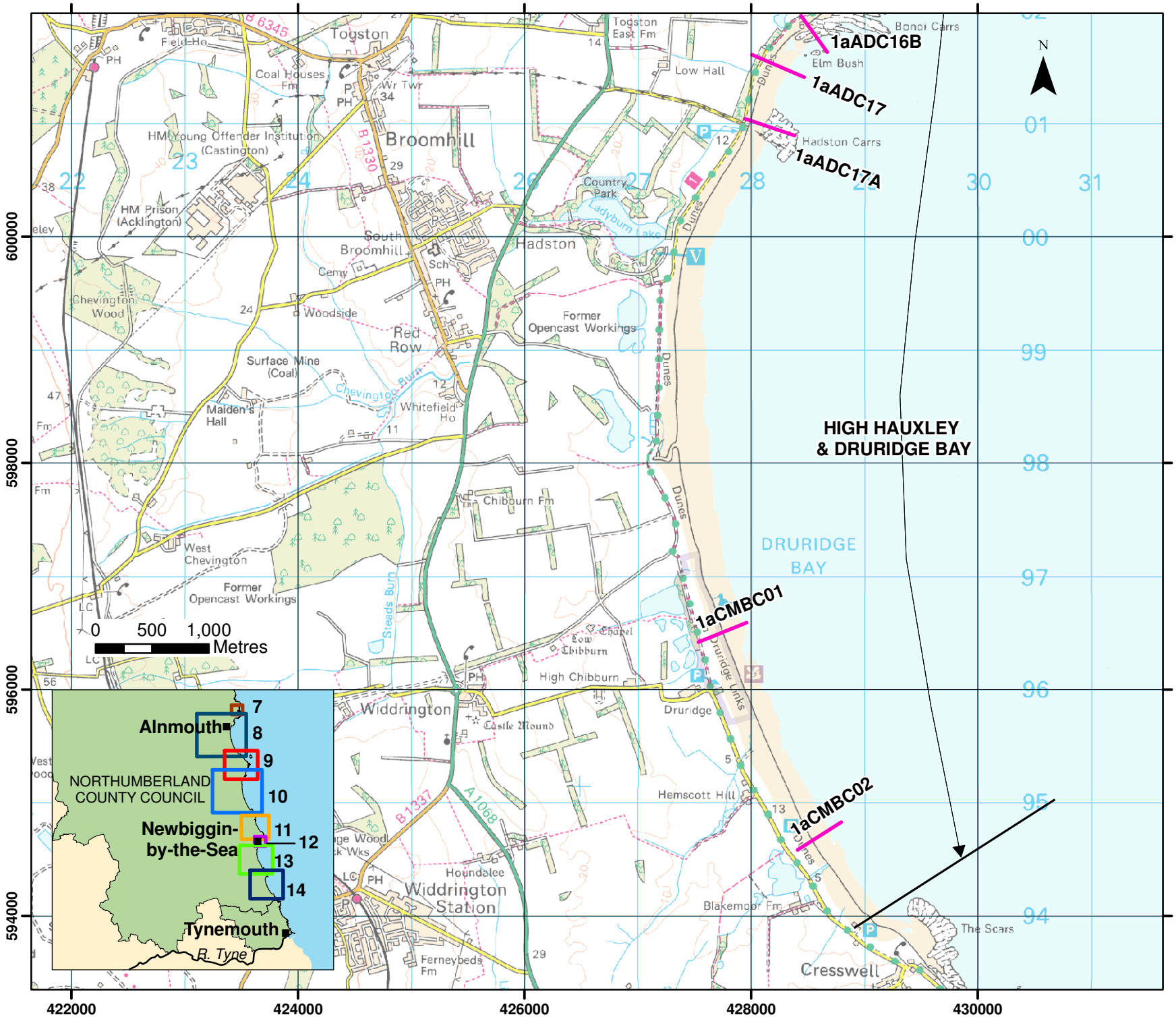

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 10 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:45,000 at A4

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Approved by:	NC	Date:	05/11/2010

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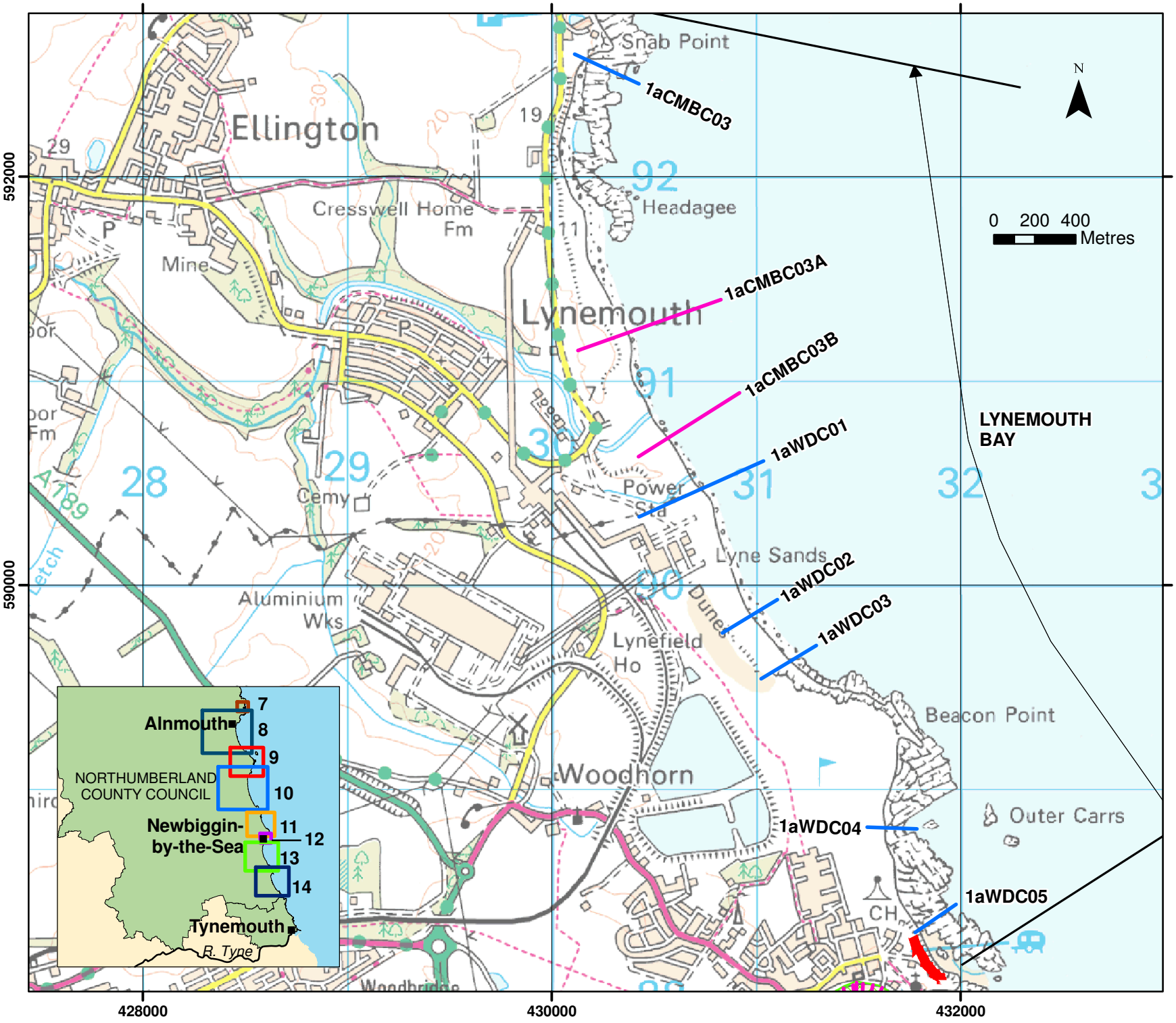

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 11 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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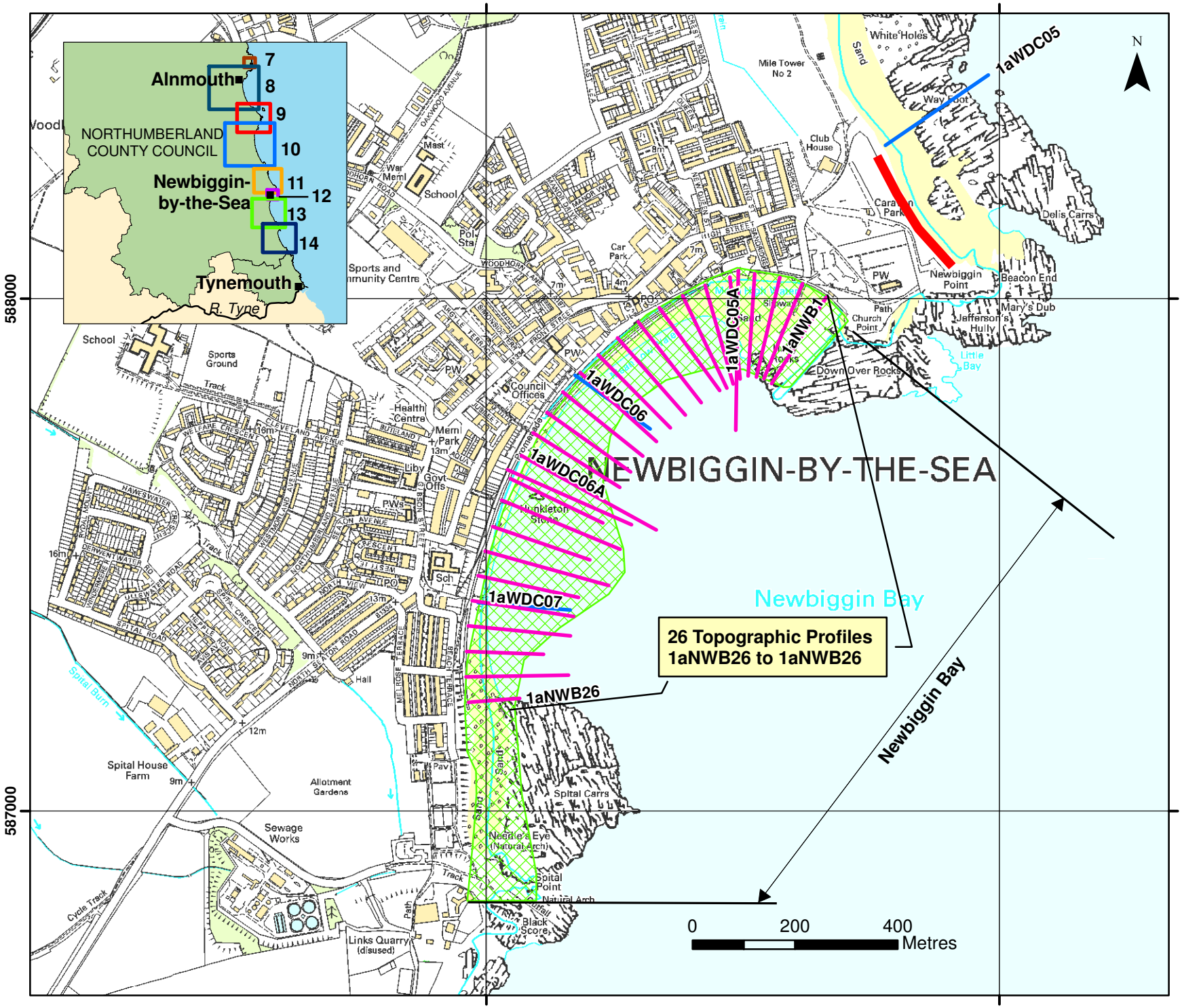

SURVEY LOCATIONS

Topographic Profiles

- Annual
- Bi-Annual

Topographic Surveys

- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 12 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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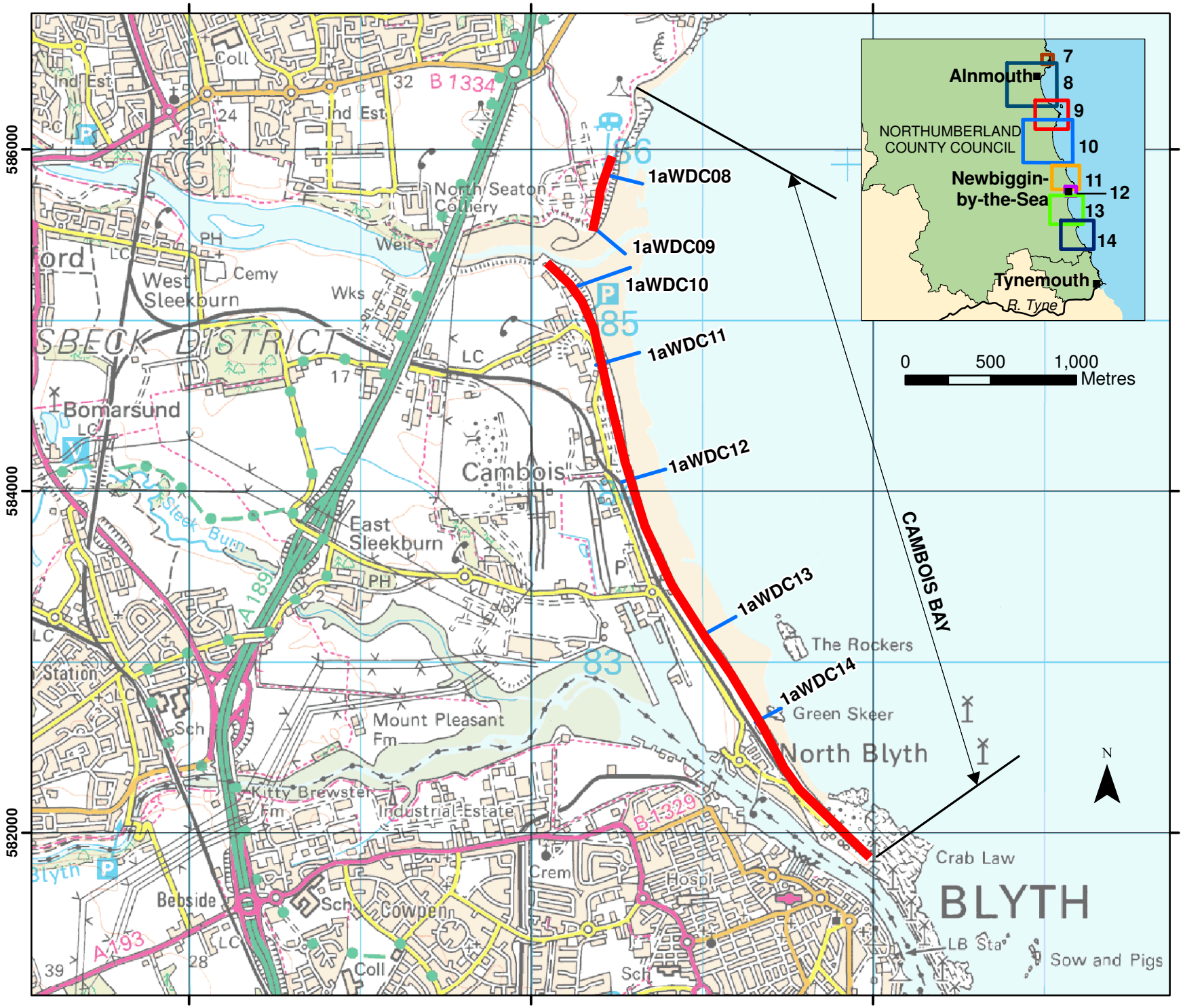

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 13 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

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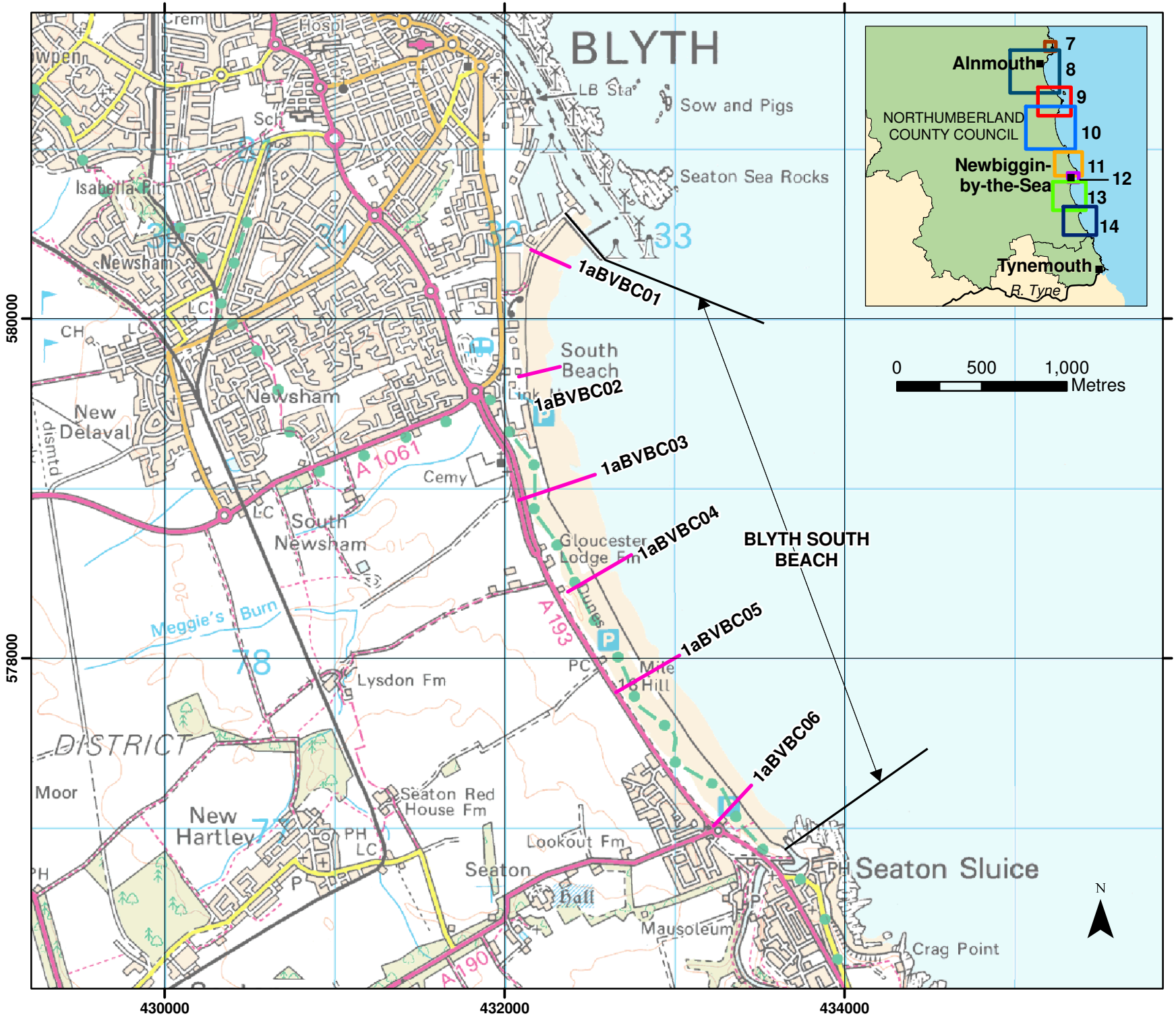

SURVEY LOCATIONS

Topographic Profiles
- Annual
- Bi-Annual

Topographic Surveys
- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey

(Indicative Survey Extents shown)

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Figure 2 - Map 14 Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:30,000 at A4

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2. Analysis of Survey Data

2.1 Sandstell Point

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Beach Profiles:** Sandstell Point is covered by ten beach profile lines during the Full Measures survey (Appendix A). Profiles BTBC01 to BTBC03 are located in front of the dunes on the south bank of the estuary. Along BTBC01 there has been a general progressive dune retreat between successive (annual) surveys since the onset of this process a few years ago. This has previously involved the landward translation of the profile, while the same form has been maintained. However, between the September 2009 and September 2010 surveys, a small section of the dune crest has eroded further landward, by around 1m, but the material liberated from this process has been deposited on the lower profile, extending the profile width as measured at MHWS back to the position recorded in April 2002. The entire profile seaward of a chainage of around 42m has accreted sediment, with levels increasing by up to 0.6m over the year. BTBC02 is surveyed 6-monthly and between September 2009 and March 2010 the profile showed some recovery in foreshore levels since the low values recorded in September 2009, despite some continued cut back of the dunes. To September 2010, this 'recovery' process continued, with further (modest) accretion to the foreshore above MHWS and also at the seaward end. Profile BTBC03 showed **significant change** since the previous survey in September 2009. By September 2010 the dunes had accreted landward of the crest, at the crest and at the seaward facing toe, whilst the foreshore showed extensive accretion. It appears that a large influx of sediment has been deposited along the entire foreshore width, extending the beach width, as measured at MHWS, by around 25m and increasing foreshore levels at the new MHWS position by around 2.8m.	The dunes along the south bank of the River Tweed estuary had progressively eroded back in recent years and it has previously been suggested that this is associated with the main river channel of the Tweed estuary encroaching further towards the southern bank as it adopts a more sinuous flow route around Sandstell Point spit. It had been postulated previously that apparent cycles of channel migration, dune response and spit behaviour at Sandstell Point are highly interlinked and this has since been the subject of further investigation in the *Tweed Estuary Study*. Along profiles BTBC01 to BTBC03 there has been **significant accretion** along parts of the foreshore (most notably along BTBC03) between September 2009 and September 2010, suggesting that there may have been a major net influx of sediment along this section of estuarine shore, caused either by the channel reversing its recent shoreward migration and now instead re-diverting offshore or by part of Sandstell Point being driven onto the shore. The 6-monthly surveys along BTBC02 suggest that perhaps the majority of this process occurred between September 2009 and March 2010, although modest further accretion of the foreshore has continued since then to September 2010 along this transect, indicating that it is a process that remains ongoing.

Survey Date	Description of Changes Since Last Survey	Interpretation
	Profiles BTBC04 (longitudinal section) and BTBC05 and BTBC06 (both cross-sections) cover the spit at Sandstell Point. BTBC04 showed **significant change** between March 2010 and September 2010 with major accretion seaward of a chainage of around 140m forming a large new bank feature which had been absent from surveys in several recent years. The landward end of the long-section did show that low levels continue at this part of the spit, with in particular two low points that appear ridge-like or channel-like. However, the significant accretion further along the spit is tending to show it is moving back towards the healthy state that was recorded in April 2002. BTBC05 and BTBC06 are transects across the spit and both show west (i.e. the river channel) on the right hand side of the plots and east (i.e. the seaward face) on the left hand side. Along BTBC05, the more landward cross-section, the narrow high berm that formed between March and September 2009 and then became flattened to a lower wider berm by March 2010 was flattened further to a very wide berm (around 200m width) at a low level (around 0.9mODN). This, in effect, has caused the spit to grow in width on its seaward side. Along BTBC06, which is slightly beyond the centre of the spit, the reverse was observed, with some of the material stored on the seaward side in a wide berm became driven onto the spit, forming a high (2.0mODN) but narrow (20m) crest. BTBC07 to BTBC10 are located along the open coast, just south of Spittal Point. All four profiles exhibited low foreshore levels in the October 2008 and September 2009 surveys and all four demonstrated accretion of foreshore levels to September 2010.	**Significant changes** continue along the spit at Sandstell Point, with the longitudinal section showing low levels remain near the root of the spit but that major accretion has occurred along the central and seaward lengths. The two cross sections indicate that this process has been caused by continued flattening of a former high and narrow crest (recorded in this form in September 2009) near the landward end of the spit, but reworking of sediment from a low, wide base at central and seaward sections into a higher and narrower crest which now exists. Along the Spittal Point open coast, which is effectively an extension of the landward root of the spit, beach levels, which were previously notably low, have improved through sediment accretion along the entire surveyed foreshore.
08-2020	**Topographic Survey:** Due to the significant changes that have been observed from the beach profiles along the spit at Sandstell Point, and the three dimensional nature of these changes, a topographic survey was introduced to the monitoring programme in November 2009. Data from the most recent topographic survey (August 2010) have been used to create a DGM (Appendix B – Map 1a) using a Geographical Information System (GIS). This shows that the crest level along the estuary shore dunes remains high and that there are distinct high ridges along the dune crest in its centre and seaward ends, with a lower band separating these from the shore nearer its root.	The topographic survey shows that a large crest has built up on the central and seaward sections of the spit, probably associated with material generally being driven from the seaward facing flanks onto the crest. Despite this, there has been continued erosion at the landward end of the spit's crest. This process of sediment redistribution also helped the beach profiles recover from previously low levels along seaward facing section of Spittal Point.

Survey Date	Description of Changes Since Last Survey	Interpretation
	Comparing this DGM against the previous survey from March 2010 (Appendix B – Map 1b) shows that there has been notable redistribution of sediment across the whole spit, with some erosion of the seaward face and accretion, generally, on the crest, although there is also a very distinct zone of erosion at the crest of the spit near its landward end, On the river-facing side of the spit, there has been accretion near the landward end, including along the dunes of the estuary shore, but erosion further seaward.	Along the estuary-facing flanks of the spit, the accretion near the landward end has extended across to the dunes, but at the seaward end of the spit there has been some erosion. The behaviour at and around the mouth of the estuary remains complex, and the inter-relationships between the changes observed along the dunes, spit and adjacent open coast shore remain strong. These inter-connectivities are being further investigated as part of the *Tweed Estuary Study.*

2.2 Spittal

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Beach Profiles:** Spittal is covered by four beach profile lines during the Full Measures survey (Appendix A). Along BTBC11 record low levels were recorded in February 2010, but by March 2010 had already started to recover. This trend continued to September 2010, with improved beach levels to a chainage of 70m (the point where the record low was previously set) and again at the seaward end of the transect, with a zone between chainages of around 70m and 150m where slight lowering occurred. Along BTBC12 the profile response was more mixed, with upper foreshore lowering but lower foreshore accretion, although changes were within previous envelopes of behaviour. BTBC13 showed a significant change, with upper foreshore accretion but a major trough feature formed between chainages of around 45m and 85m, resulting in new record low levels at these locations. Further seaward along the profile, there was modest accretion. BTBC14 showed foreshore lowering, by up to 1m, along its length.	Changes along BTBC11 still appear connected to changes occurring at the mouth of the estuary. Elsewhere, there was no consistent trend along the Spittal beach, with quite significant lowering along the southern end near Bear's Head rocks (as measured along BTBC14) and a large trough formed along BTBC13.

2.3 Goswick Sands

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Beach Profiles:** Goswick Sands is covered by six beach profile lines during the Full Measures survey (Appendix A). There was some minor beach lowering directly at the toe of the dunes along BTBC15, with relatively low foreshore levels also recorded along the remainder of the profile. The main dune ridge was unaffected since the September 2009 survey. Similar beach lowering occurred at the toe of the dunes along BTBC16, although the foreshore experienced accretion along its remaining length, by up to 0.2m since March 2010. Lowering at the toe of the dunes also occurred along BTBC17, resulting in cut back in dune position at the toe, but no other changes along the dune face or crest. In contrast, there was accretion at the dune toe along BTBC18 since September 2009, with notable foreshore accretion also occurring, raising lower foreshore levels by around 0.3m. Although there was little change since March 2010 in upper and mid beach levels along BTBC19, the lower foreshore did accrete sediment, with levels increasing by up to 0.4m locally. Along BTBC20 there was accretion of around 0.1m along the whole profile length, including directly at the toe of the dunes.	The northern section of Goswick Sands (BTBC15 to BTBC17) has always tended to be more dynamic that the section further south. The three profiles along this section all experienced some beach lowering at the dune toe which may make them vulnerable to storm erosion over the impending winter months, although at present there are no major signs of concern. The area of Goswick Sands further south, between North Low and South Low (BTBC18 to BTBC20), has remained relatively stable since the surveys began in April 2002, due mainly to a large expanse of protective sand flat that is built out towards Snook Point on Holy Island. This section generally accreted sediment since the previous surveys and remains in healthy condition.

2.4 Holy Island

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Beach Profiles:** Holy Island is covered by eight beach profile lines during the Full Measures survey (Appendix A). BTBC21 to BTBC23 are located on the north side of the island, along The Snook. There is great stability in the sand flats and sand dunes measured along these profile lines, with BTBC22 experiencing modest foreshore accretion and dune growth. BTBC24 to BTBC28 are located on the south side of the island in the vicinity of the castle and priory. BTBC27 actually extends out to, and across, the small island upon which the remains of a chapel stand. All profiles show very little change since the previous survey.	The sand flats and sand dunes around Holy Island (as measured by the eight beach profile lines) remain very stable in both form and position.
08-2010	**Topographic Survey:** Holy Island causeway and a defined width of adjacent sand flats are covered by an annual topographic survey which commenced in October 2004. The purpose of this survey was to determine whether raising of the causeway had any negative impacts on the adjacent sand flats in terms of accretion or erosion. Data from the current survey (August 2010) have been used to create a DGM (Appendix B – Map 2a) using a Geographical Information System (GIS). This figure shows that the channel of South Low is currently in a different position to that observed when the Ordnance Survey base-map was produced. This DGM has been compared against a similar DGM created using the October 2009 data (Appendix B – Map 2b). This shows, as in previous surveys, that changes between the two successive surveys are mostly very minor and where they do exist are mostly focused around the channel flanks of South Low, associated with changes in channel position and/or width. Now that there is 6 years of data in existence, the DGM has also been compared against a similar DGM created using the October 2004 data (Appendix B – Map 2c) to identify longer-term trends. This shows that the most notable changes remain adjacent to the river channel, but there is also a zone just to the east of the channel where (very modest) overall net accretion has occurred over this time.	It has previously been noted that most changes between successive surveys along Holy Island causeway are located along the flanks of the channel of South Low. This trend continues to the current survey. By examining the current survey against the earliest survey, some 6 years ago, a longer-term picture can now be identified. This shows most changes are associated with the natural variations in position of the South Low channel, but there is also a distinct zone to the east of the channel where modest net accretion to both the north and the south of the causeway. Since there remain numerous lengths of sandflat immediately adjacent to the causeway which show no significant net change over the past 6 years, this must be considered as a natural trned and not directly attributable to the causeway raising.

2.5 Bamburgh

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Beach Profiles:** Bamburgh is covered by one beach profile line during the Full Measures survey (Appendix A), located approximately 750m south-east of the castle. Following a succession of surveys which have shown great stability in the dunes and foreshore along BTBC29 , the present survey shows foreshore lowering at the toe of the dunes and some cut-back at the toe. Although the main dune face and crest are unaffected, the current profile shows the lowest levels and most seaward position at the dune toe since surveys began in April 2002 and there may be some erosion over the impending winter should beach levels not recover prior to significant storm events.	Bamburgh beach (as measured along BTBC29) suffered lowering and cut back of the dunes between September 2009 and October 2010 and due to this may be susceptible to further erosion over the impending winter months.

2.6 Beadnell Village

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Beach Profiles:** Beadnell Village is covered by two beach profile lines during the Full Measures survey (Appendix A). BTBC30 is around 300m to the north of the village and shows a stable dune position but upper foreshore lowering since the previous survey (September 2009). The changes remain well within the bounds of previous behaviour. BTBC31 is in Nacker Hole and extends across the promenade and seawall. The upper beach level experienced a small amount of accretion at the toe of the sea wall since March 2010, but in general the profile form remained relatively stable.	The foreshores within Beadnell Village showed minor redistribution of sediment across the profile since the previous surveys and changes were within the envelope of previously observed behaviour.

2.7 Beadnell Bay

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Beach Profiles:** Beadnell Bay is covered by nine beach profile lines during the Full Measures survey (Appendix A). BTBC32 to BTBC34 are located in the north of Beadnell Bay. BTBC32 is immediately in the lee of Beadnell Harbour. The most recent survey shows signs of redistribution of sand from the lower profile to the mid and upper sections of beach since the previous survey in September 2009. BTBC33 exhibited minor sediment redistribution along the main profile, but although a notable volume of sand appears to have been eroded from the dune crest this is actually due to surveyors not being able to access the same points at the crest due to the presence of dense bush vegetation. BTBC34 generally showed lowering close to the dune toe between March 2010 and October 2010, and levels remained quite low along the upper and mid foreshore, but a notable berm was present on the lower foreshore. BTBC35 to BTBC38 are located between Burn Carrs and the outfall of Brunton Burn/Long Nanny. BTBC35 and BTBC36 both showed relatively low beach levels along their entire lengths, but no major erosion at the toe of the dunes. BTBC37 showed similarly low beach levels, but with some dune cut-back, while BTBC38 showed cut-back at the dune toe but increase in upper foreshore levels. ADC01 and ADC02 are located along the frontage to the south of the outfall of Brunton Burn/Long Nanny. Profile ADC01 experienced modest accretion at the crest, seaward face and toe of the dunes, and the foreshore experienced modest accretion along almost all of its length. The only area of exception was just seaward of MSL where a previously recorded berm was flattened, locally lowering foreshore levels. Along ADC02 some accretion at the toe of the dunes offset the cut-back previously recorded.	Changes in the north of Beadnell Bay, in the vicinity of the harbour, were generally within previous bounds of previously observed behaviour but foreshore levels remained low along some sections. Between Burn Carrs and the outfall of Brunton Burn/Long Nanny, upper foreshore levels generally recovered, although a more mixed response was observed along the lower foreshore. Furthermore, along profiles closer to the river outfall, ridge and runnel features became noted, perhaps associated with secondary drainage flow from the river outfall. South of the river, the profiles showed some modest accretion following the dune toe cut-back that was recorded in March 2010.

2.8 Embleton Bay

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Beach Profiles:** Embleton Bay is covered by two beach profile lines during the Full Measures survey (Appendix A). ADC03 is located towards the north of the bay, north of Embletonburn Mouth. ADC04 is located towards the south of the bay. A similar profile change was recorded along both ADC03 and ADC04, whereby the berm previously recorded in September 2009 at the toe of the dunes became flattened, resulting in a lowering of foreshore levels at the toe of the dunes and a related landward cut-back in the position of the dune toe by around 2 - 4m. Sand liberated from the dunes and upper beach by these processes was deposited on the mid and lower profile, where levels generally increased.	Along the measured profiles there was a redistribution of sand from the upper beach, where some dune cut-back occurred, to the mid and lower beach, where accretion occurred. The steep nature of the dune toe may lead to further cut back over the impending winter if beach levels remain low.

2.9 Boulmer

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Beach Profiles:** Boulmer is covered by two beach profile lines during the Full Measures survey (Appendix A). These were added to the programme in October 2007. Along ADC04A the dune face accreted slightly, but directly at the toe of the dunes the foreshore lowered locally. Between around HAT and MHWS the upper foreshore accreted, but the trough located at a chainage of between 35m and 50m became deeper and wider. At the seaward end of the profile, the sand veneer evident on previous surveys had become removed, leaving bedrock exposed. Along ADC04B there was also local lowering along the upper beach, but elsewhere changes were marginal compared to the March 2010 survey.	Whilst there are no major concerns at the present time, the persistent small-scale lowering of the beach at the dune toe needs continued observation.

2.10 Alnmouth

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Beach Profiles:** Alnmouth Bay is covered by ten beach profile lines during the Full Measures survey (Appendix A). ADC05 and ADC06 are located in the small pocket beach that is contained by the rock outcrops of Brady Carrs and Marden Rocks. Both profiles exhibited very minor change since the previous (September 2009) survey, although the slight accretion previously observed along the upper beach of ADC06 became reduced by September 2010, with the material being deposited lower down the profile to create a flatter form. ADC07, ADC08 and ADC09 are located between Marden Rocks and the mouth of the River Aln estuary. Along ADC07 there was slight accretion along the upper beach, with a mid zone of stability and a slight degree of lowering along part of the lower foreshore followed at the seaward end of the profile with some accretion. In contrast, there was lowering along the whole length of ADC08, although this was only of a relatively modest scale. ADC09 experienced the opposite of this, with accretion by up to around 0.5m along the whole profile length. ADC10 to ADC14 are spaced between the south bank of the River Aln estuary and the North Breakwater of Warkworth Harbour at the mouth of the River Coquet estuary. Along ADC10 the foreshore recovered from the record low levels recorded in September 2009, and a distinct berm remained visible on the mid beach. Along ADC11 there was some redistribution of sediment along the upper beach, but lowering to new record low levels around MSL. Profile ADC12 showed slight further cut-back of the near-vertical dune face but otherwise relatively stable form. More significant cut-back of the dune toe occurred along ADC13, where the lower dune face now remains in an over-steepened condition. Profile ADC14, in contrast, experienced some dune face accretion and relatively healthy foreshore levels.	Profiles between Brady Carrs and Marden Rocks remain relatively stable. Between Marden Rocks and the mouth of the River Aln each of the three profiles showed different trends: redistribution of sediment along the profile (ADC07); lowering across the whole profile (ADC08); and accretion along the whole profile (ADC09). This makes interpretation of profile changes alone difficult and reinforces the value and importance of the Topographic Survey along this section of beach (see below). The most notable change along the frontage to the south of the River Aln estuary was the dune cut-back along transects ADC12 (modest) and ADC13 (more significant), with the latter likely to experience further erosion due to the presently over-steepened gradient of the lower dune face.

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Topographic Survey:** The northern part of Alnmouth Bay (to the north of the River Aln estuary) is covered by bi-annual topographic survey which commenced in April 2005. Data from the current survey (September 2010) have been used to create a DGM (Appendix B – Map 3a). In contrast to the March 2010 survey, the position of the outflow channel of the River Aln estuary is adopting a different discharge route to sea, with an initially more direct alignment across the upper beach being followed by a section with greater sinuosity across the mid and lower beach. The DGM from the current survey has been compared against a similar DGM created using the March 2010 data (Appendix B – Map 3b). This reveals that changes in the foreshore are similar to those observed by the profiles with three clear different behaviours: a redistribution of sediment from the mid beach (erosion) to both upper and lower beaches (accretion) in the north of the surveyed area; universal erosion across the beach width in a central section of the frontage; and universal accretion across the whole beach width towards the south.	The northern section of Alnmouth Bay, between the river mouth and Marden Rocks, continues to show notable redistribution of sand, with particular areas of accretion noted in the lee of where the river channel has adopted a more direct discharge alignment, but erosion where the channel has then become more sinuous and cut-back into areas of beach. The changes between March 2010 and September 2010 are not, however, as great as those which occurred previously between September 2009 and March 2010, although in the central section of the frontage the dunes do remain susceptible to future storm damage due to relatively low beach levels and the channel incising into the beach, bring energy closer to the shore along this section.

2.11 High Hauxley and Druridge Bay

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Beach Profiles:** High Hauxley to Druridge Bay is covered by nine beach profile lines during the Full Measures survey (Appendix A). Four of these (with 'A' or 'B' suffices) were added to the programme in October 2007. Profile ADC15 extends across the extensive dunes at Amble Links and then across the foreshore. Between October 2007 and October 2008 the seaward profile experienced notable landward recession, resulting in the lowest beach levels recorded to date. The main dunes field was unaffected. Between October 2008 and September 2009 and again to October 2010, further recession was not experienced, but upper and mid foreshore levels remained relatively low. Seaward of a chainage of around 140m, lower foreshore accretion occurred ADC15A, ADC16 and ADC16A are all located around Hauxley Haven. Following the storm damage at the toe of the dunes and beach lowering along upper foreshore previously observed to April 2010 along ADC15A a degree of stability resumed, with minor redistribution of sediment occurring. This resulted in healthier beach levels at the toe of the dunes, modest lowering further along the mid profile, and lower foreshore accretion. Along both ADC16 and ADC16A accretion occurred down to around MHWN, with material being moved up-profile causing lower beach lowering and upper beach accretion. ADC16B, ADC17 and ADC17A are located between Bondi Carrs and Hadston Carrs and extend seawards from Togston Links. Profile ADC16B experienced lowering between April 2010 and October 2010, although a thin sand veneer generally remained covering the underlying bedrock, except for where outcrops protrude through the sand at three locations along the profile length. The backing dunes exhibited a stable position and form. Along ADC17 the slight cut back at the toe of the dunes observed in April 2010 remained, leaving them in a slightly over-steepened state. Additionally, the accretion previously recorded along the profile length reduced slightly, but still remained well within the bounds of previous behaviour. The previous relatively low beach levels at the toe of the dunes along ADC17A recovered back to typically observed levels, with only modest redistribution of sand along the rest of the profile.	Previous recession of the beach fronting Amble Links (along ADC15) has stopped, suggesting it was a single cut-back driven by a storm event rather than an ongoing trend. Beaches around Hauxley Haven showed redistribution of sediment across the profiles following the storm damage early in 2010. Generally, levels along the lower foreshore reduced, but levels along the upper foreshore and directly at the dune toe increased following the storm damage previously experienced. Between Bondi Carrs and Hadston Carrs beach profiles generally experienced changes within the bounds of previous observations.

Survey Date	Description of Changes Since Last Survey	Interpretation
	CMBC01 and CMBC02 are located in the southern sections of Druridge Bay. CMBC01 experienced lowering of the upper foreshore and landward cut-back at the toe of the dunes by around 20m between September 2009 and April 2010. Whilst no further cut-back occurred at the dune toe between April 2010 and October 2010, the dune remains in an over-steepened form and the entire foreshore suffered further lowering to new record low levels. A berm was formed at the seaward end of the profile. CMBC02 suffered a small degree of erosion along the lower part of the seaward face of the dunes, but there was accretion directly at the toe, raising beach levels at MHWS by around 0.4m. Further seaward along the profile, levels also increased, with a berm form at the seaward end.	In the southern half of Druridge Bay, the dunes along profile CMBC01 remain in an over-steepened form and the continued foreshore lowering leaves them susceptible to storm damage over the impending winter of 2010/11. CMBC02 did experience some further minor cut-back but the foreshore levels at the toe increased. Along both profiles, a berm was formed at the seaward end of the transects.

2.12 Lynemouth

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Beach Profiles:** Lynemouth is covered by six beach profile lines during the Full Measures survey (Appendix A). Two of these, profiles CMBC03A and CMBC03B, were added to the programme in October 2007. CMBC03 is located just to the south of Snab Point headland and continues to exhibit great stability in the form and position of the cliff and rocky foreshore. CMBC03A and CMBC03B are located to the north of Lynemouth Power Station and both extend across the extensive slag banks before reaching the foreshore. Along CMBC03A sediment redistribution occurred along the profile, with lowering of the upper foreshore down to around MHWS, slight increases in the level of the lower profile, and reduction in level at the very seaward end. At present the slag bank has not started eroding, but there remains only a very narrow width before the toe of the slag bank would start to become cut in to. Along CMBC03B the process of slag bank erosion has been progressively ongoing for some years. The most recent survey reveals a further cut back of the seaward edge of the bank, by around 5m since March 2010, and lowering at the toe of the slag bank and further lowering of the foreshore levels. WDC01 extends from seaward of the rock revetment down to low water across the extensive slag banks. Further landward cut-back has occurred since the September 2009 survey. WDC02 and WDC03 are to the south of the Power Station. Along both profiles there was cut-back of the seaward face of the profile at around HAT and redistribution of this material to the landward slope of the slag heap. In the case of WDC03 in particular, some material was also carried over the crest of the structure and deposited on the landward face.	To the north of Lynemouth Power Station, there remains irreversible and ongoing foreshore lowering and landward retreat of the slag bank along CMBC03B. This appears a clear and consistent trend over recent years. In just the last three years, the slag bank has eroded landwards by around 17m and this process remains ongoing. Along profile CMBC03A, slightly further north, the onset of slag bank erosion has been anticipated since there is only a very narrow upper beach width seaward of its toe. At the revetment extension in front of the coal stocking yard the foreshore has further retreated landwards. It is understood that the bank is periodically replenished with slag by Alcan to prevent undermining of the backing rock revetment extension and recent trends in foreshore behaviour suggest this is an essential management practice. To the south of Lynemouth Power Station, the slag heaps continue to experience processes of wash-over, leading to landward migration of the seaward face and deposition of liberated material on the crest and landward slope of the bank.

2.13 Newbiggin-by-the-Sea

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Beach Profiles:** Newbiggin-by-the-Sea is covered by six beach profile lines during the Full Measures survey (Appendix A). Two of these, profiles WDC05A and WDC06A, were added to the programme in October 2007 specifically to help assess the performance of the capital scheme involving beach replenishment and construction of an offshore breakwater. In addition a further 26 profiles (NWB1 to NWB26) have been surveyed since September 2010 as part of the post-project evaluation, providing sufficient data to form a full Topographic Survey of Newbiggin Bay (see section below). WDC04 and WDC05 are to the north of Newbiggin Point. Along WDC04 a berm was formed at around MHWS, with upper foreshore lowering landward of this point and lower foreshore accretion seaward of this point. Along WDC05, the high upper beach levels recorded in September 2009 had reduced considerably, with lowering of up to 0.75m observed by September 2010. Material liberated during this process was distributed along the mid profile where levels increased by up to 0.8m, with a berm formed around MHWS. Rock outcrops remained exposed at the seaward end of both of these profiles. WDC05A is in the north of Newbiggin Bay and experienced dramatic increases in beach level between October 2007 and April 2008 following the replenishment scheme. Since then changes have been mostly continued accretion, slowing down in rate of change to the current survey, which exhibited a modest increase in beach levels along the mid and upper beach compared with the previous (April 2010) survey, with a notably large berm still being present above HAT. In the northern-central section of the bay, as measured along WDC06, the profile experienced a massive increase in sand volume by October 2007 following replenishment and then notable subsequent cut back to the present survey, which leaves a beach width of only 6m to the stepped toe apron of the sea wall, when measured at MHWS. In fact, at the upper beach, one section has cut back so much that the stepped toe apron of the wall has become exposed by September 2010.	To the north of Newbiggin Point, beach changes were generally within normal bounds of behaviour, although the levels directly at the toe of the cliff at Newbiggin Moor (WDC04) were low. Within Newbiggin Bay, there remains ongoing redistribution of sediment from northern-central sections of the bay (profile WDC06), where cut-back of the profile continues, to the north of the bay (profile WD05A), where accretion continues. The cut-back along WDC06 is so severe that the stepped toe apron of the seawall was protruding and this represents a concern that is in need of further investigation. In the centre of the bay, the initial cut-back along WDC06A appears to have occurred and now there appears to be a successive redistribution of sediment occurring between surveys along the profile length. There remains a reasonably healthy width of beach between the sea wall and the level of HAT.

Survey Date	Description of Changes Since Last Survey	Interpretation
	WDC06A is located centrally within Newbiggin Bay and after the major replenishment (captured on the October 2007 survey) experienced notable cut-back to April 2008 and then a degree of recovery to October 2008. Subsequent cut-back to April 2009 once again recovered to the next survey (September 2009) which exhibited a similar profile to that recorded in October 2008. A further cycle of cut back to April 2010 and then (slight) recovery to September 2010 has occurred since. Along WDC07, towards the south of the bay, the width between the sea wall and the crest of the upper beach berm remains consistent with that recorded in September 2009, and the profile generally experienced a modest amount of accretion.	In the south of the bay, along WDC07, the profile has remained relatively stable over the past year.
09-2010	**Topographic Survey:** The topographic survey of Newbiggin Bay comprises a series of 26 beach profiles plus additional intervening 'spot heights' and was added to the programme in September 2010 specifically to help assess the performance of the capital scheme that was constructed in 2007, which involved beach replenishment and an offshore breakwater. Prior to incorporation in the programme, these surveys were undertaken on occasions between 2007 and 2010 as part of the scheme development.	Comparison of the present (September 2010) topographic survey against earlier scheme-related surveys is to be undertaken and reported within the following report: *Newbiggin Bay Beach Surveys 2007-2010*, Royal Haskoning, due early in 2011.
09-2010	**Cliff Top Survey:** Data relating to the cliff top surveys are best viewed as digital 'kmz' files loaded into Google Earth. **Newbiggin Caravan Park:** This survey was introduced to the monitoring programme in September 2007 and is repeated at 6-monthly intervals. It covers the cliffs in front of Newbiggin Caravan Park, located to the immediate north of Newbiggin Point. The northern part of this frontage (approximately 70m in length) is unprotected by defences. Since the previous survey (March 2010), two areas of erosion have occurred. One is a small slump along a length of around 3m, where the cliff top has cut-back by aup to 0.3m. The other is along a more significant length, of around 10m, where the cut back has been up to 1.5m at the greatest point. When compared against the first survey (September 2007) recession has occurred along the whole undefended length of cliffs, typically by around 0.5m but up to 1.5m locally.	Changes in cliff top position along Newbiggin Caravan Park are mostly occurring in the undefended section in the north of the frontage. Between March 2010 and September 2010 one large slump has occurred, causing a local cut back in the cliff top position by around 1.5m. Central and southern sections of the frontage exhibit little change over time.

Survey Date	Description of Changes Since Last Survey	Interpretation
	The central section of this frontage (approximately 125m in length) is protected by concrete blocks and rubble. Due to this, most of the frontage is stable when compared against the previous (March 2010) and first (September 2007) surveys. The southern section of surveyed cliff (around 80m in length) is fronted by a rocky shore platform. This section is also mostly relatively stable, when compared against the previous (March 2010) and first (September 2007) surveys.	

2.14 Cambois

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Beach Profiles:** Cambois is covered by seven beach profile lines during the Full Measures survey (Appendix A). Profiles WDC08 and WDC09 are located to the north of the River Wansbeck estuary in front of Sandy Bay Caravan Park. WDC08 extends from the cliff across the rock berm onto the foreshore. There are no significant changes in the cliff top position or cliff face at this profile, but seaward of the rock berm the entire profile reduced in level by up to 0.4m. This remains within the bounds of previously recorded behaviour. WDC09 extends from the cliffs at the very southern end of the Caravan Park. Here the cliff top and face has cut back very significantly since the previous (September 2009) survey, by around 5m. Since surveys began in April 2002, the cliff has now cut back by10m in total. Foreshore levels directly at the toe of the cliffs increased, with the mid section of foreshore lowering and the seaward section accreting. Profiles WDC10 to WDC14 are all located along Cambois Bay, between the River Wansbeck and River Blyth estuaries. WDC10 is located just to the south of Cambois House. The profile form exhibited a large berm between around MSL and MHWN in September 2009, but by September 2010 this had been flattened. Despite this, the profile levels were lower than those recorded in September 2009 along much of the profile and at the landward end (to a chainage of 25m) the profile cut back very severely, lowering to a record low level of 2.8mODN at the toe of the undefended cliffs. WDC11 extends across the rock revetment fronting the now disused foundry. Beach levels at the toe of the defence recovered slightly since the previous survey in September 2009, and the changes along the foreshore were within the bounds of previously observed behaviour, with a notable berm formed at the seaward limit.	To the north of the River Wansbeck estuary, along Sandy Bay Caravan Park, the existing rock berm is providing protection to the cliffs along WDC08, but the undefended cliffs further south at WDC09 are eroding. A major recession event (or series of events) occurred between September 2009 and September 2010, most likely over the severe winter of 2009/10 (as supported by the six-monthly cliff top surveys; see relevant section below). Over the past year some 5m of cliff top has been lost along WDC09. The cumulative total erosion since surveys began in April 2002 has now been around 10m; that half of this recession has occurred in the past year shows how severe the most recent winter season has been. To the south of the River Wansbeck estuary, the severe lowering along WDC10 resulted in very low beach levels at the toe of the undefended cliffs, such that it is likely that storms will directly attack the already eroding lower cliff face.

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	Along WDC12, situated approximately mid-way along Cambois Bay, the berm and runnel identified on the mid-beach in September 2009 had been destroyed by quite significant foreshore lowering to new record low values. Whereas previously the position and form of the backing dunes had always remained generally stable, there was cut back at the toe by around 10m since the September 2009 survey (as measured at MHWS). A notable berm had also formed at the seaward limit of this transect, similar to that along WDC11. A similar trend of foreshore lowering and berm formation at the seaward end was observed along WDC13, although this suffered no dune cutback at the landward end. For the first time since surveys began in April 2002, the sand veneer along WDC14 became entirely stripped off the beach, fully revealing the underlying bedrock. Whilst in some previous surveys rock has been observed outcropping through the sand in discrete places, the profile has been previously recorded as being entirely bare of sediment. The cliff at the landward end eroded landwards marginally.	In the central and southern sections of Cambois Bay, the profiles revealed universally low beach levels, generally with a berm formed at the seaward limit. This caused notable cut back at the toe of the dunes along WDC12, new record low beach levels to be established and, in the case of WDC14, the bedrock to become entirely exposed for the first time since records began.

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Cliff Top Surveys**: Data relating to the cliff top surveys are best viewed as digital 'kmz' files loaded into Google Earth. **Sandy Bay Caravan Park:** This survey was introduced to the monitoring programme in September 2007 and is repeated at 6-monthly intervals. It covers the cliffs in front of the southern sections of Sandy Bay Caravan Park (i.e. the area where caravans are closets to the cliff edge), located to the immediate north of the mouth of the River Wansbeck estuary. When comparisons are made between the previous survey (February 2010) and the current survey (September 2010), there have been two main areas of change, separated by a more stable central section in the lee of the three nearshore rock berm coastal defence structures. The first area of change is at the northern end of the surveyed cliffs, where activity has occurred as three separately, but closely located, slips. The most northerly of these occurs over a length of around 12m, causing a maximum cliff top cut-back of 0.8m. The cumulative erosion here since the first survey in September 2007 is now 3.5m. Just south of there is another slip, over a length of around 7.5m and cutting back the cliff top by around 0.85m. A further length of around 6m has also eroded by up to 1.0m at a small 'headland' in the cliff top alignment. Both of these recent slips are newly active locations. South of the rock berms, extending to the southern limit of the survey, there were four areas of major change since the previous survey (February 2010). The most northerly occurred along an 8m length, cutting back the cliff top by around 1.9m (or a cumulative 3.5m since September 2007). A further length of 9m experienced some 1.6m cut-back (a cumulative 5.7m since September 2007). A third area over an 8m length cut back by around 0.6m (a cumulative 2.4m) and the entire southern frontage over a length of around 30m cut back by up to 1.5m, representing a cumulative 3–4m of erosion since September 2007. When considering changes between the first survey (September 2007) and the current survey (September 2010), it is evident that a large length of this frontage has been actively eroding over the three years of monitoring. The most active area is to the south of the rock bunds. Even in the area fronted by rock bunds, the cliffs have eroded locally in places.	The cliffs along Sandy Bay Caravan Park continue to exhibit erosion in a number of discrete locations. Between February 2010 and September 2010 there have been a number of individual events which have resulted in quite marked cut-back in cliff top position (by up to 1.9m in places). Locally in individual slumps, mainly towards the very south of the site, recession since surveys began in September 2007 has resulted in cumulative erosion of up to 5.7m. This has particular implications for the caravans located near to the cliff edge in the south of the site. **IMPORTANT NOTE:** Just to the north of the surveyed area, around Coffin Rocks and Bull Rock, an angler tragically died after falling around 15m from the cliff top onto the beach when the cliff edge he was standing on collapsed. This happened on the evening of 6th January 2010 following a prolonged period of adverse weather, including heavy snow and ice. It is likely that the freeze-thaw cycles on the cliff face weakened the rock structure and the increased loading on the cliff from the deep snow and ice further contributed to the rock fall. This section of cliff top is not currently surveyed.

Survey Date	Description of Changes Since Last Survey	Interpretation
10-2010	**Cliff Top Surveys**: Data relating to the cliff top surveys are best viewed as digital 'kmz' files loaded into Google Earth. **Cambois:** This survey was introduced to the monitoring programme in April 2009 and is repeated at 6-monthly intervals. It covers the cliffs along Cambois, extending between the mouth of the River Wansbeck estuary (south bank) and the East Pier at Blyth Harbour. Since the previous survey (March 2010), the cliff top position has remained relatively stable directly at Cambois House, despite notable erosion at the toe. Immediately south of Cambois House's garden, however, there has been further 'trimming' of the cliff top following the measureable erosion that occurred between September 2009 and February 2010, and two newly active sections. The first is along a 10m length of cliff top just to the north of the cottages where around 1.2m of recession has occurred. The second is more significant and covers a length of around 80m immediately south of the cottages where erosion of up to 1.75m has occurred. The cliff edge remains stable behind the rock revetment that was built to protect the former foundry and also stable behind the revetment that starts at North Blyth. In between these two areas of coastal defence, however, the undefended dunes have generally experienced erosion of around 0.2 – 0.3m, but there are some notable lengths where this has increased to 2m-3m and other areas where dune accretion of a similar order of magnitude has occurred.	The Cambois frontage exhibited signs of quite widespread activity, especially in the cliffs in the vicinity of the cottages towards the north of Cambois Bay and along the main undefended central dune section between the two large revetments. It is likely that some of the material released from dune erosion was retained on the foreshore and has contributed to some dune growth, thereby representing a redistribution of sediment. Areas protected by existing defence structures remain unaffected by changes in cliff top position.

2.15 Blyth South Beach

Survey Date	Description of Changes Since Last Survey	Interpretation
09-2010	**Beach Profiles:** Blyth South Beach is covered by six beach profile lines during the Full Measures survey (Appendix A). BVBC01 is located towards the north of South Beach, in front of the area of land owned by Port of Blyth. Prior to the previous survey in April 2010 a storm occurred in February 2010 that resulted in lowering of the upper beach profile and cut back at the toe of the very narrow strip of dunes, leaving over-steep conditions. Whilst these conditions remain at the dunes in September 2010, the upper foreshore recovered through accretion of sand. Further accretion was also experienced along the lower profile. Following the general recovery in beach levels between September 2009 and April 2010 along BVBC02, the most recent survey reveals lowering once again, universally along the profile length, with levels directly at the toe of the sea wall reducing to March 2009 values. BVBC03 experienced notable lowering of the upper beach between September 2009 and April 2010, but this had recovered somewhat to September 2010. The dunes did not show signs of further erosion, but remain in a relatively steep condition at their seaward facing edge. BVBC04, located just to the south of Gloucester Lodge Farm in the centre of South Beach, showed modest recovery in upper foreshore levels, but quite notable lowering along the lower beach, although this generally remained within the envelope of previous change. BVBC05 exhibited general lowering along its length, although the dunes remained stable, whilst BVBC06 was very similar in level to the April 2010 survey, but with a berm formed above HAT, as was the form in most recently in March 2009.	The vulnerability of the dunes in the north of Blyth South Beach remains an issue of concern, mainly due to the very narrow width protecting the port access road. Whilst the upper foreshore has recovered somewhat since the record low values were observed along BVBC01in April 2010, the dune front remains in an over-steep condition and the width of protective dunes is only around 20m. Further south, along central and southern sections, beach level variability becomes slightly less with progression south along the frontage, but in all sections is linked mainly with sequences of berm formation and flattening in response to dominant wave conditions.

3. Problems Encountered and Uncertainty in Analysis

Surveying the cliff top along Cambois Bay is more difficult than the similar surveys at Newbiggin Caravan Park and Sandy Bay Caravan Park because along Cambois Bay, especially in the northern section, the cliff edge is less distinct due to vegetation coverage and a bevelled form, rather than possessing a distinct cliffed edge. Due to this a degree of surveyor interpretation needs to be made in definition of the cliff 'top'. Consequently a long-term record is required before results from this surveying technique become truly meaningful.

4. Recommendations for 'Fine-tuning' the Monitoring Programme

No changes are recommended at the present time.

5. Conclusions and Areas of Concern

- Significant changes, and inter-relationships, continue to be observed at the mouth of the River Tweed estuary. Storm activity has driven sediment from the seaward flank of the Sandstell Point spit onto its crest along its central and seaward lengths, resulting in a high narrow crest now being present. At the landward end, however, lowering continued. On the river-facing flank accretion occurred near the root, but erosion occurred at the seaward end.

- Associated with these changes, the foreshore fronting the dunes on the south bank reversed recent trends of erosion and experienced accretion, especially notable near the root of the spit.

- Along Spittal Point (open coast frontage) the previously recorded low beach levels experience recovery through sand accretion.

- Further south along the main Spittal frontage, there was no consistent trend in behaviour and this frontage continues to be dynamic.

- Goswick Sands showed beach lowering at the dune toe in some locations, potentially leaving the frontage somewhat vulnerable to storm damage over the forthcoming winter.

- Holy Island remains stable, with no major concerns identified along the sandflats adjacent to the causeway following its raising.

- Bamburgh is only characterised by one beach profile transect, but this has shown stability until the current survey when some lowering of the upper foreshore and dune cut-back was observed for the first time.

- Beadnell Village and Beadnell Bay show no concerns at the current time.

- Embleton Bay profiles exhibited a steep dune toe, which may make them vulnerable to erosion over the impending winter months.

- Boulmer shows persistent small-scale lowering of the beach and dune toe which needs observation.

- Alnmouth Bay continues to exhibit notable change in the vicinity of the outfall of the River Aln estuary, with three distinctly different zones of behaviour noted.

- No major concerns were identified in Hauxley or Druridge Bay, although in the southern half of Druridge Bay some of the dunes how loe beach levels at their toe which leaves them vulnerable to storm-induced erosion.

- Irreversible foreshore erosion remains ongoing at Lynemouth to the north of the Power Station and significant cut back of the slag was also noted seaward of the rock revetment extension to the coal stocking yard.

- The replenished beach within Newbiggin Bay continues to exhibit redistribution of sand, and the low levels towards the centre of the bay – which revealed sections of the stepped toe apron of the sea wall – is of some concern and is currently under more detailed investigation.

- Along Newbiggin Caravan Park, the unprotected section of cliffs have cut back significantly in places, with one major slump eroding the cliff top by 1.5m.

- Erosion remains ongoing also along Sandy Bay Caravan Park, with cut-back particularly severe at the southern boundary of the site where one event triggered a set-back in cliff top position of several metres.

- Along Cambois the foreshore levels were low at the toe of the undefended cliffs in the north and along the undefended dunes in the central and southern sections. Along the undefended sections of cliff there was widespread activitiy, particularly in the vicinity of the cliff top cottages. The dunes experienced cut-back, but some liberated sand remained in the bay and caused dune accretion elsewhere.

- Blyth South Beach remains an area of potential vulnerability due to its relatively high exposure to incoming waves.

Appendices

Appendix A

Beach Profiles

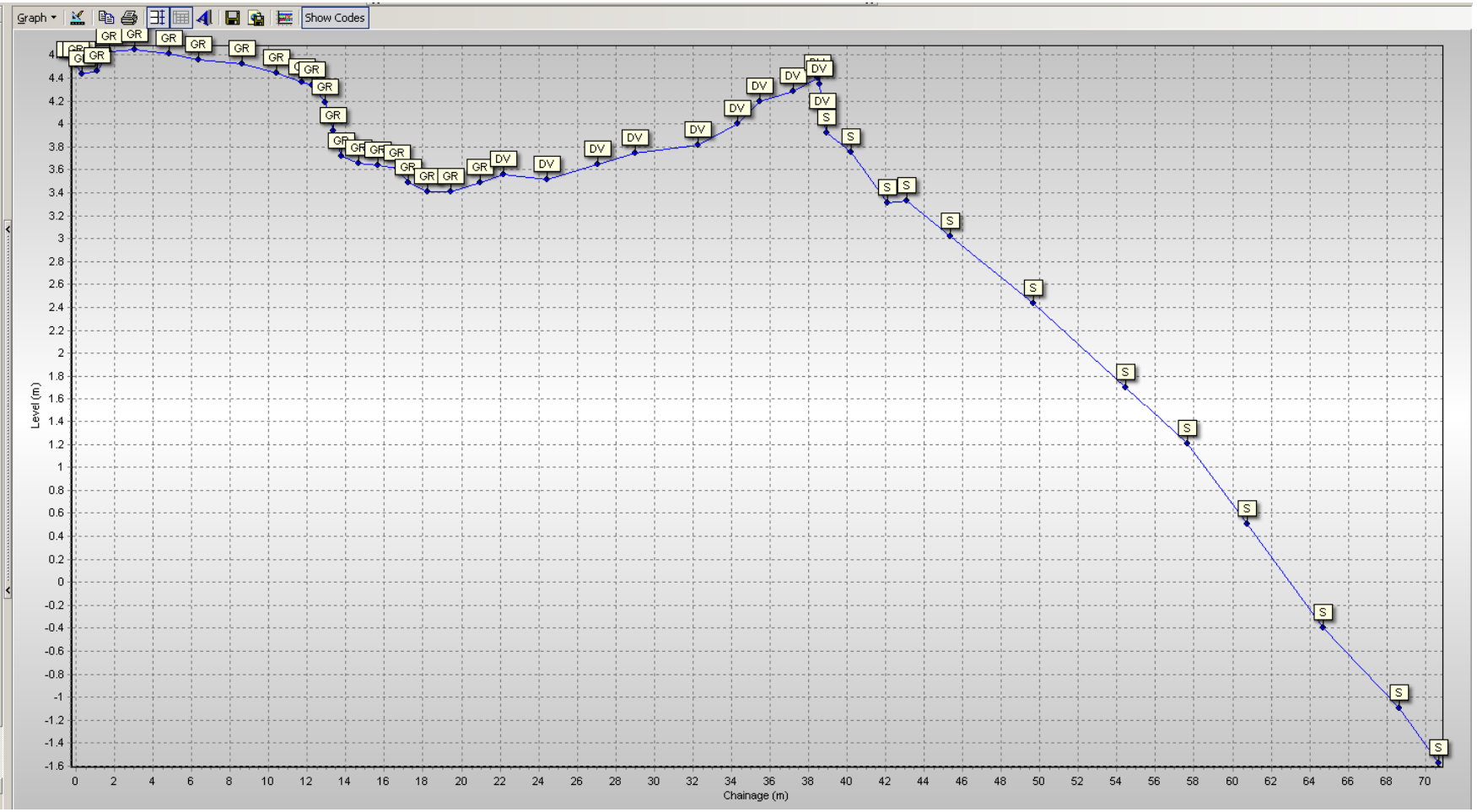
The following sediment feature codes are used on some profile plots:

Code	Description
M	Mud
S	Sand
G	Gravel
GS	Gravel & Sand
GM	Gravel & Mud
MS	Mud & Sand
B	Boulders
R	Rock
SD	Sea Defence
SM	Salt Marsh
GR	Grass
D	Dune (non-vegetated)
DV	Dune (vegetated)
F	Forested
X	Mixture
FB	Obstruction
CT	Cliff Top
CE	Cliff Edge
CF	Cliff Face
SH	Shell
W	Water Body
ZZ	Unknown

Northumberland CC (Berwick)

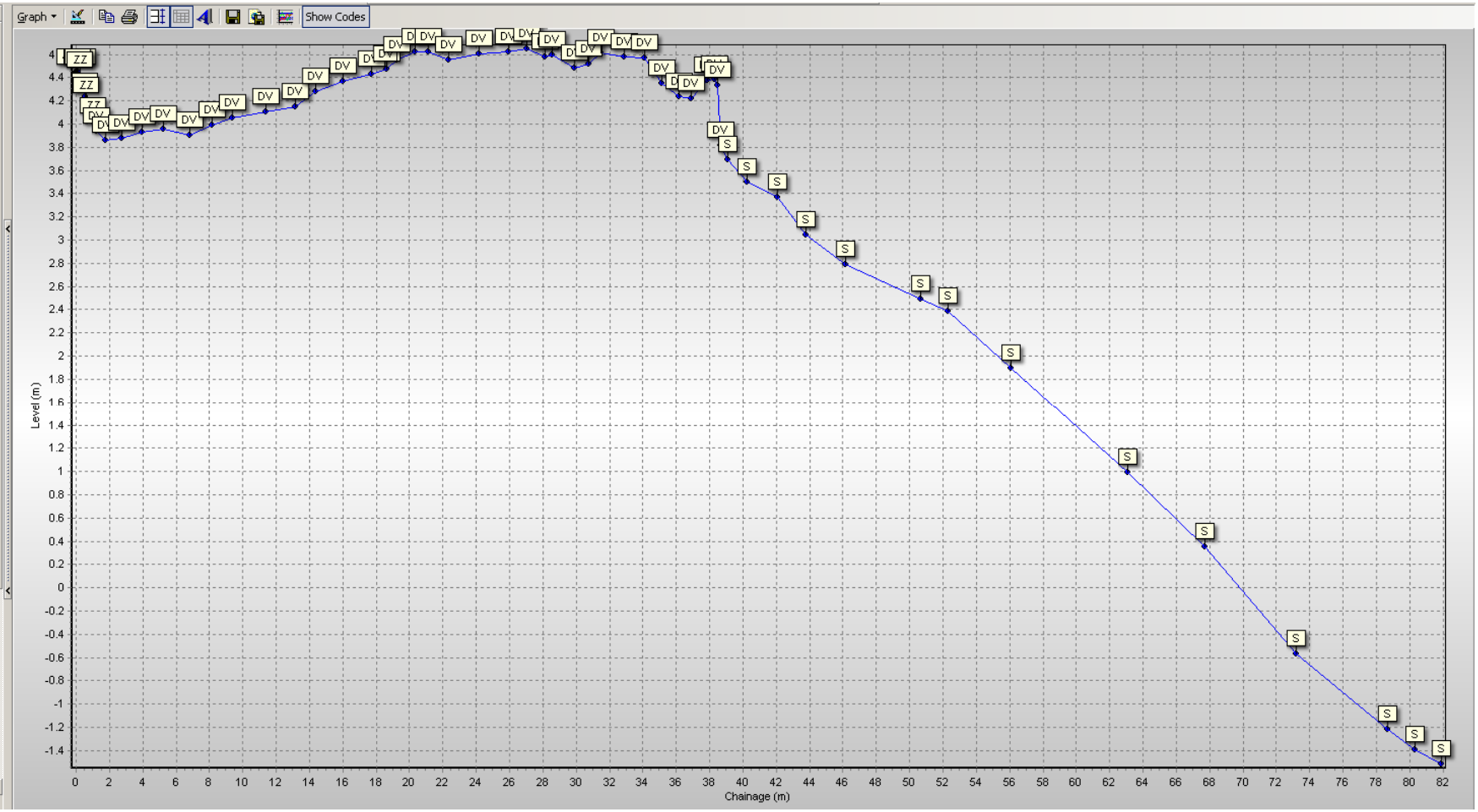
1aBTBC01 - 23/09/2010

Chainage	Level	Code
0.000	4.514	
0.024	4.514	GR
0.318	4.433	GR
1.084	4.461	GR
1.748	4.630	GR
3.041	4.648	GR
4.819	4.616	GR
6.375	4.558	GR
8.635	4.523	GR
10.387	4.445	GR
11.723	4.368	GR
12.262	4.340	GR
12.915	4.189	GR
13.338	3.936	GR
13.747	3.716	GR
14.674	3.661	GR
15.684	3.641	GR
16.686	3.609	GR
17.233	3.491	GR
18.228	3.413	GR
19.464	3.412	GR
20.973	3.491	GR
22.157	3.560	DV
24.439	3.518	DV
27.052	3.647	DV
29.000	3.741	DV
32.268	3.820	DV
34.315	4.001	DV
35.500	4.200	DV
37.232	4.282	DV
38.486	4.400	DV
38.575	4.349	DV
38.756	4.068	DV
38.964	3.925	S
40.203	3.751	S
42.122	3.313	S
43.111	3.332	S
45.340	3.024	S
49.681	2.434	S
54.429	1.705	S
57.645	1.205	S
60.776	0.503	S



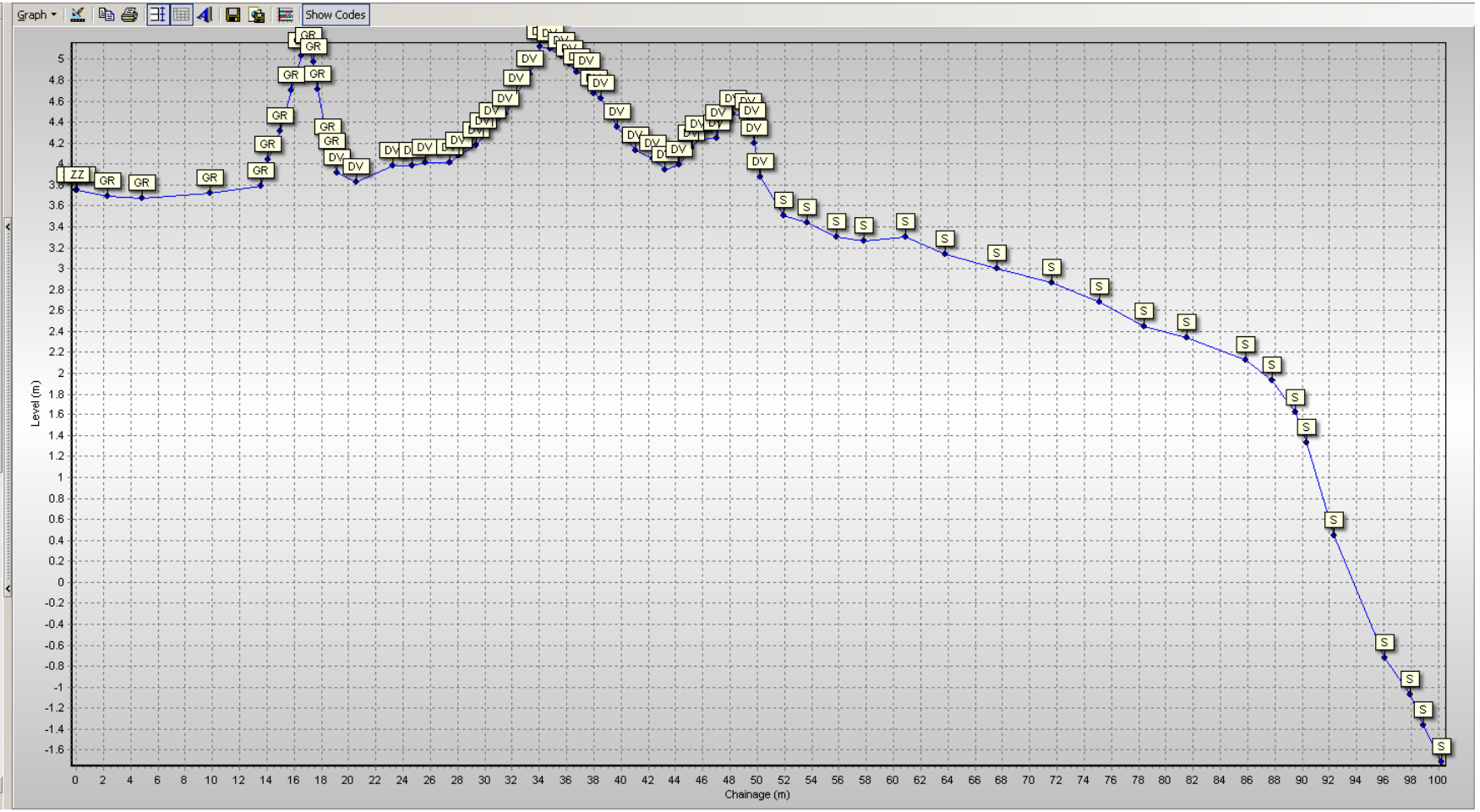
1aBTBC02 - 23/09/2010

Chainage	Level	Code
0.000	4.449	
0.035	4.449	ZZ
0.152	4.447	ZZ
0.273	4.417	ZZ
0.545	4.234	ZZ
0.605	4.204	ZZ
1.065	4.025	ZZ
1.207	3.936	DV
1.788	3.864	DV
2.752	3.876	DV
3.983	3.932	DV
5.262	3.959	DV
6.795	3.901	DV
8.185	3.994	DV
9.353	4.052	DV
11.369	4.109	DV
13.131	4.148	DV
14.388	4.277	DV
16.010	4.367	DV
17.742	4.426	DV
18.620	4.476	DV
19.270	4.552	DV
20.311	4.625	DV
21.119	4.620	DV
22.369	4.556	DV
24.173	4.603	DV
25.913	4.621	DV
27.006	4.649	DV
28.108	4.578	DV
28.573	4.594	DV
29.869	4.486	DV
30.737	4.521	DV
31.506	4.612	DV
32.911	4.583	DV
34.127	4.572	DV
35.147	4.347	DV
36.186	4.238	DV
36.918	4.219	DV
37.901	4.377	DV
38.298	4.388	DV
38.475	4.331	DV
38.650	3.814	DV



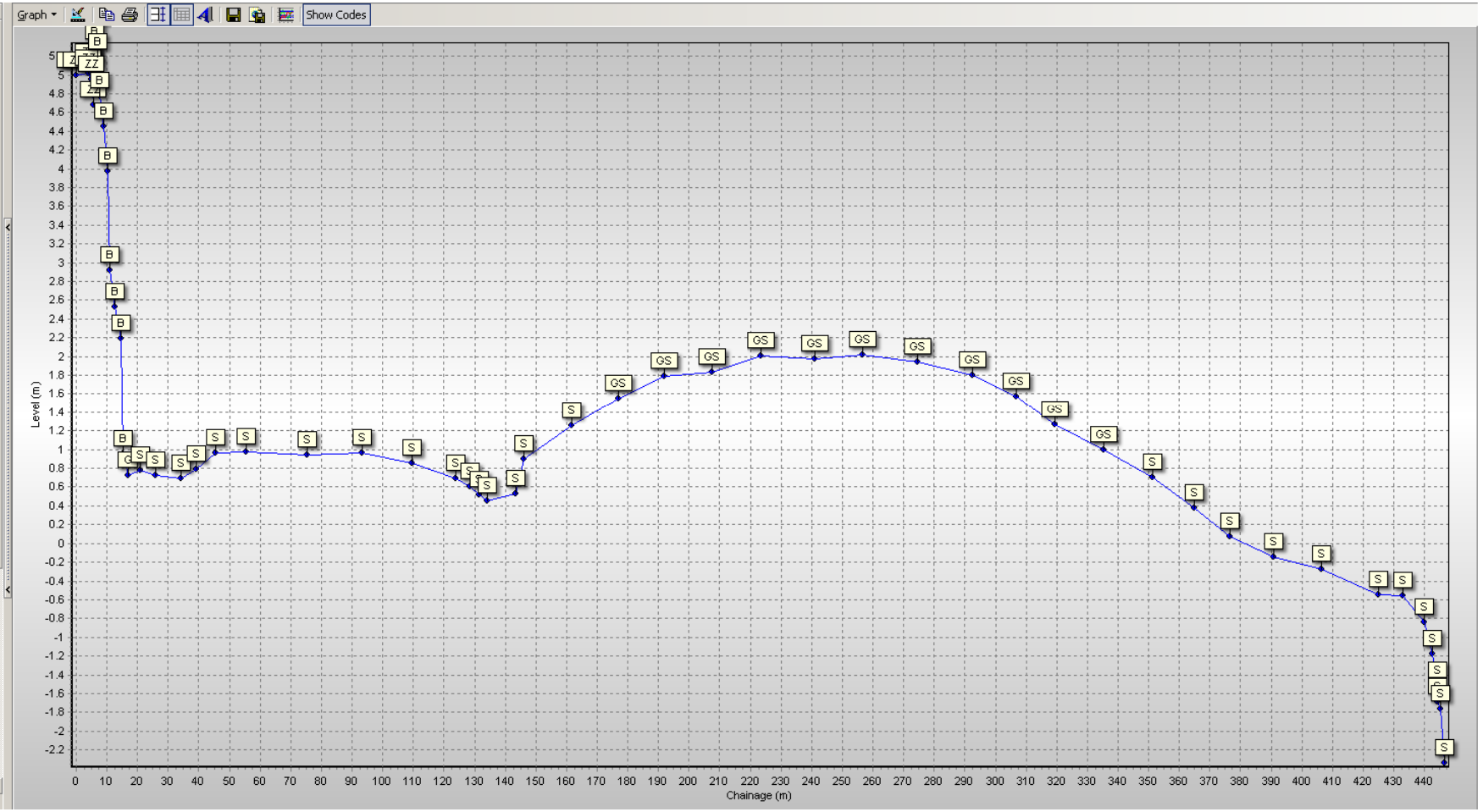
1aBTBC03 - 23/09/2010

Chainage	Level	Code
0.000	3.748	
0.092	3.748	ZZ
2.306	3.687	GR
4.830	3.669	GR
9.824	3.725	GR
13.570	3.785	GR
14.106	4.040	GR
14.945	4.318	GR
15.809	4.704	GR
16.563	5.033	GR
17.053	5.083	GR
17.445	4.974	GR
17.705	4.714	GR
18.464	4.206	GR
18.777	4.074	GR
19.178	3.919	DV
20.542	3.824	DV
23.237	3.979	DV
24.672	3.985	DV
25.611	4.016	DV
27.452	4.012	DV
28.086	4.079	DV
29.367	4.176	DV
29.861	4.261	DV
30.567	4.362	DV
31.555	4.475	DV
32.379	4.677	DV
33.313	4.861	DV
34.052	5.120	DV
34.813	5.098	DV
35.635	5.036	DV
36.226	4.951	DV
36.737	4.880	DV
37.472	4.843	DV
38.038	4.672	DV
38.517	4.626	DV
39.747	4.357	DV
41.070	4.127	DV
42.337	4.051	DV
43.215	3.943	DV
44.307	3.996	DV
45.159	4.150	DV



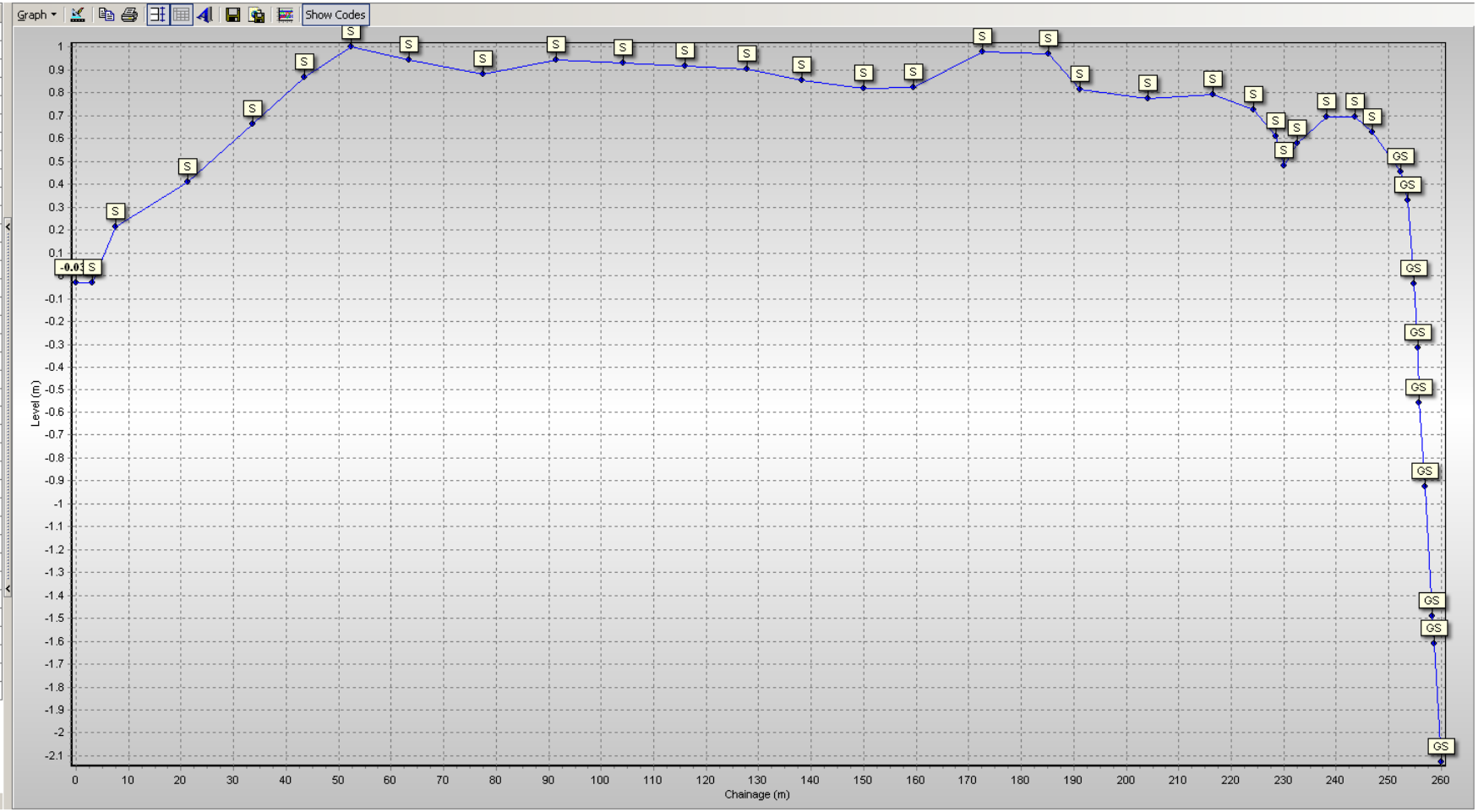
1aBTBC04 - 23/09/2010

Chainage	Level	Code
0.000	4.997	
0.155	4.997	ZZ
3.992	5.015	ZZ
4.020	5.084	ZZ
4.104	5.087	ZZ
4.140	5.020	ZZ
4.990	4.952	ZZ
5.722	4.678	ZZ
5.955	5.299	B
6.833	5.189	B
7.584	4.774	B
8.894	4.447	B
10.329	3.969	B
10.878	2.916	B
12.673	2.526	B
14.449	2.193	B
15.303	0.951	B
17.046	0.720	G
20.985	0.776	S
25.818	0.728	S
34.335	0.697	S
39.047	0.791	S
45.452	0.959	S
55.406	0.971	S
75.237	0.943	S
93.449	0.960	S
109.481	0.859	S
123.972	0.694	S
128.378	0.607	S
131.648	0.518	S
134.046	0.453	S
143.571	0.529	S
146.015	0.904	S
161.789	1.257	S
177.082	1.548	GS
192.020	1.793	GS
207.604	1.833	GS
223.387	2.005	GS
241.069	1.970	GS
256.680	2.015	GS
274.732	1.944	GS
292.646	1.805	GS



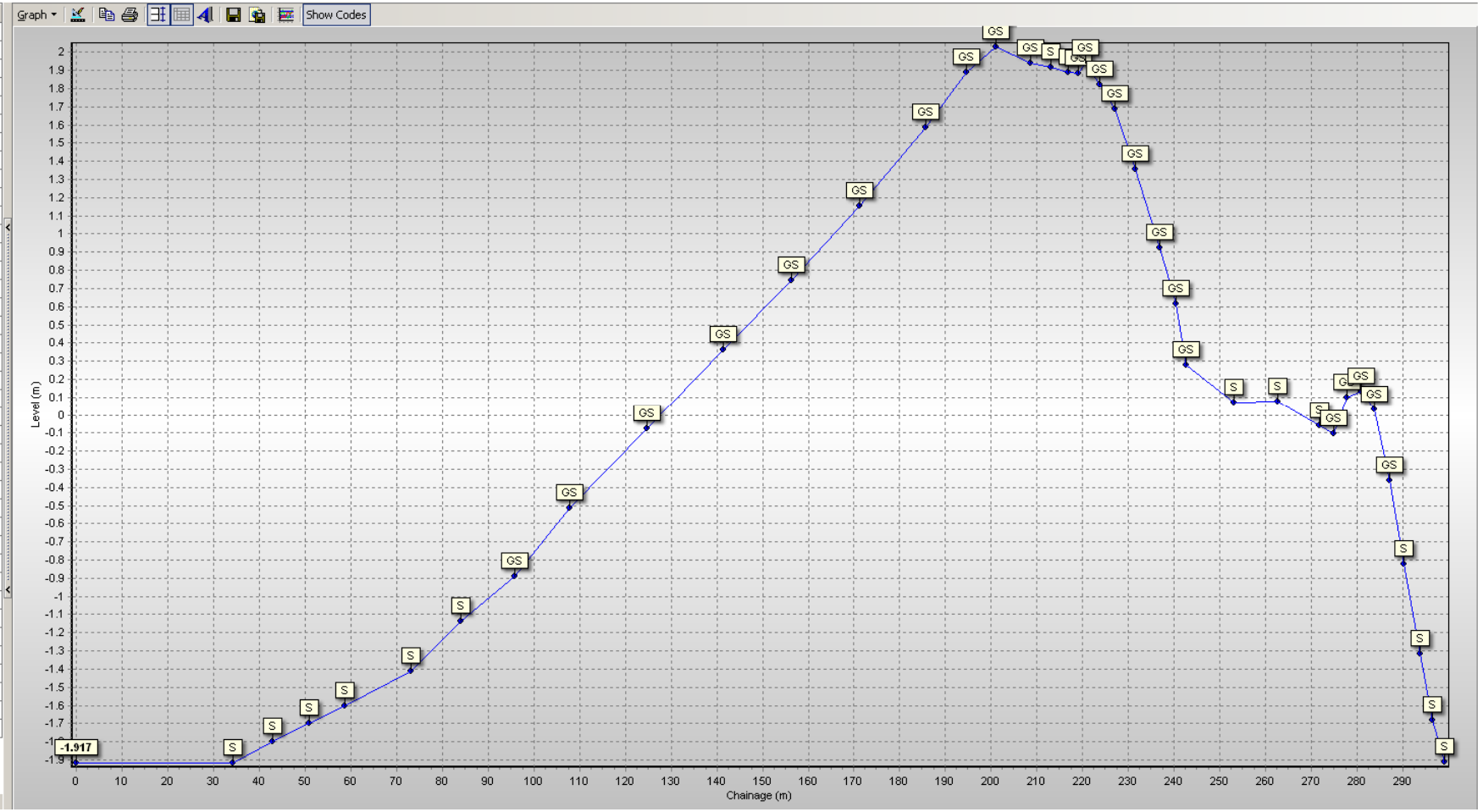
1aBTBC05 - 23/09/2010

Chainage	Level	Code
0.000	-0.031	
3.027	-0.031	S
7.566	0.214	S
21.274	0.409	S
33.639	0.665	S
43.584	0.867	S
52.321	1.002	S
63.391	0.946	S
77.608	0.884	S
91.517	0.944	S
104.265	0.929	S
116.080	0.916	S
127.793	0.906	S
138.205	0.857	S
150.085	0.818	S
159.531	0.823	S
172.621	0.980	S
185.253	0.971	S
191.098	0.813	S
204.220	0.775	S
216.483	0.791	S
224.318	0.726	S
228.467	0.611	S
229.965	0.480	S
232.495	0.580	S
238.113	0.696	S
243.646	0.694	S
246.887	0.626	S
252.221	0.453	GS
253.711	0.328	GS
254.714	-0.034	GS
255.533	-0.315	GS
255.672	-0.558	GS
257.015	-0.926	GS
258.191	-1.489	GS
258.641	-1.610	GS
260.017	-2.127	GS



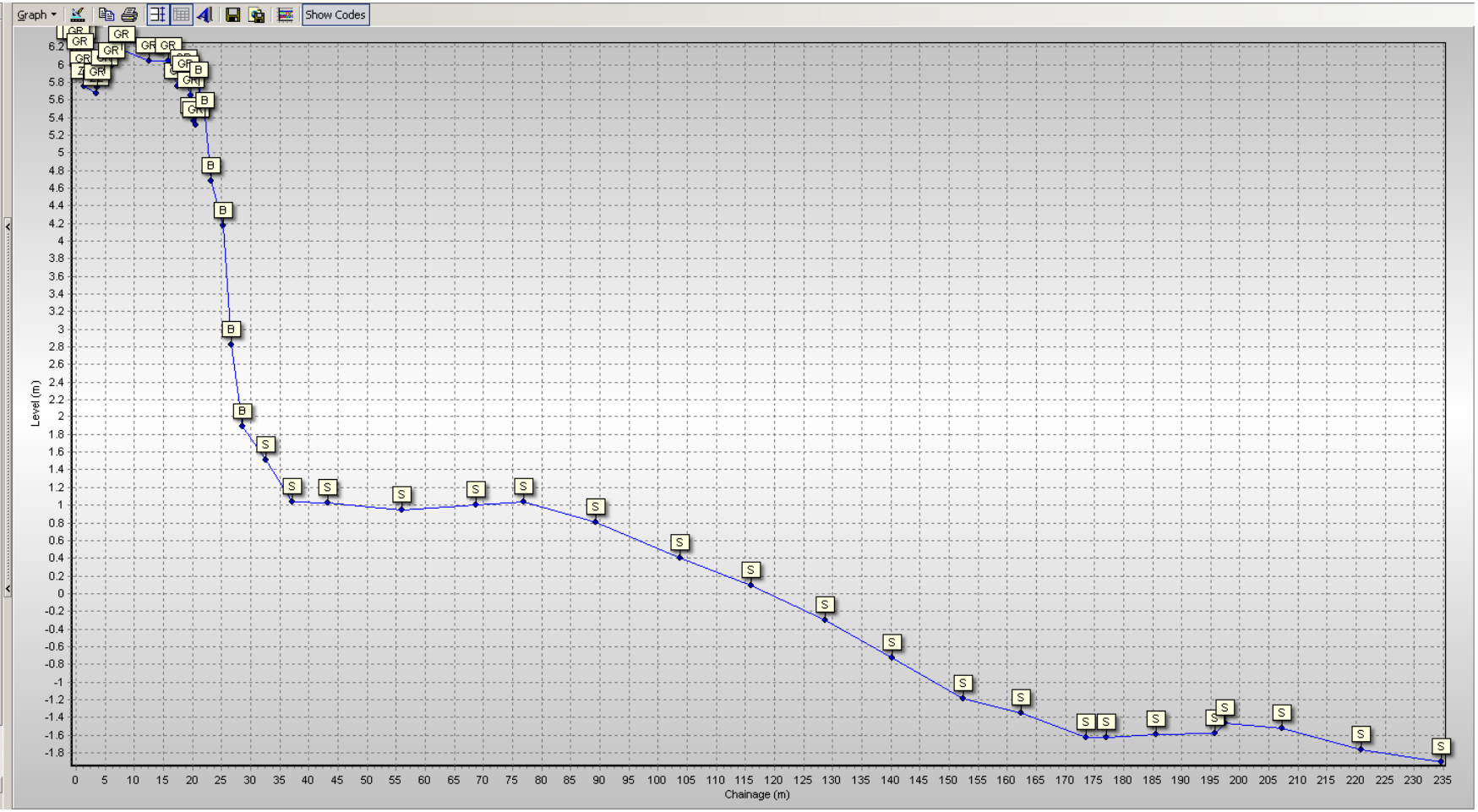
1aBTBC06 - 23/09/2010

Chainage	Level	Code
0.000	-1.917	
34.176	-1.917	S
42.977	-1.798	S
50.949	-1.697	S
58.698	-1.601	S
73.192	-1.412	S
84.011	-1.134	S
95.814	-0.890	GS
107.816	-0.515	GS
124.828	-0.073	GS
141.475	0.360	GS
156.428	0.744	GS
171.214	1.155	GS
185.758	1.588	GS
194.590	1.887	GS
201.040	2.030	GS
208.492	1.939	GS
213.134	1.916	S
216.775	1.887	S
219.130	1.884	GS
220.667	1.938	GS
223.719	1.822	GS
227.073	1.690	GS
231.529	1.357	GS
236.850	0.923	GS
240.290	0.613	GS
242.668	0.279	GS
253.104	0.073	S
262.525	0.074	S
271.729	-0.058	S
274.864	-0.105	GS
277.754	0.098	GS
280.957	0.135	GS
283.645	0.032	GS
286.993	-0.362	GS
290.206	-0.824	S
293.719	-1.318	S
296.466	-1.681	S
299.087	-1.910	S



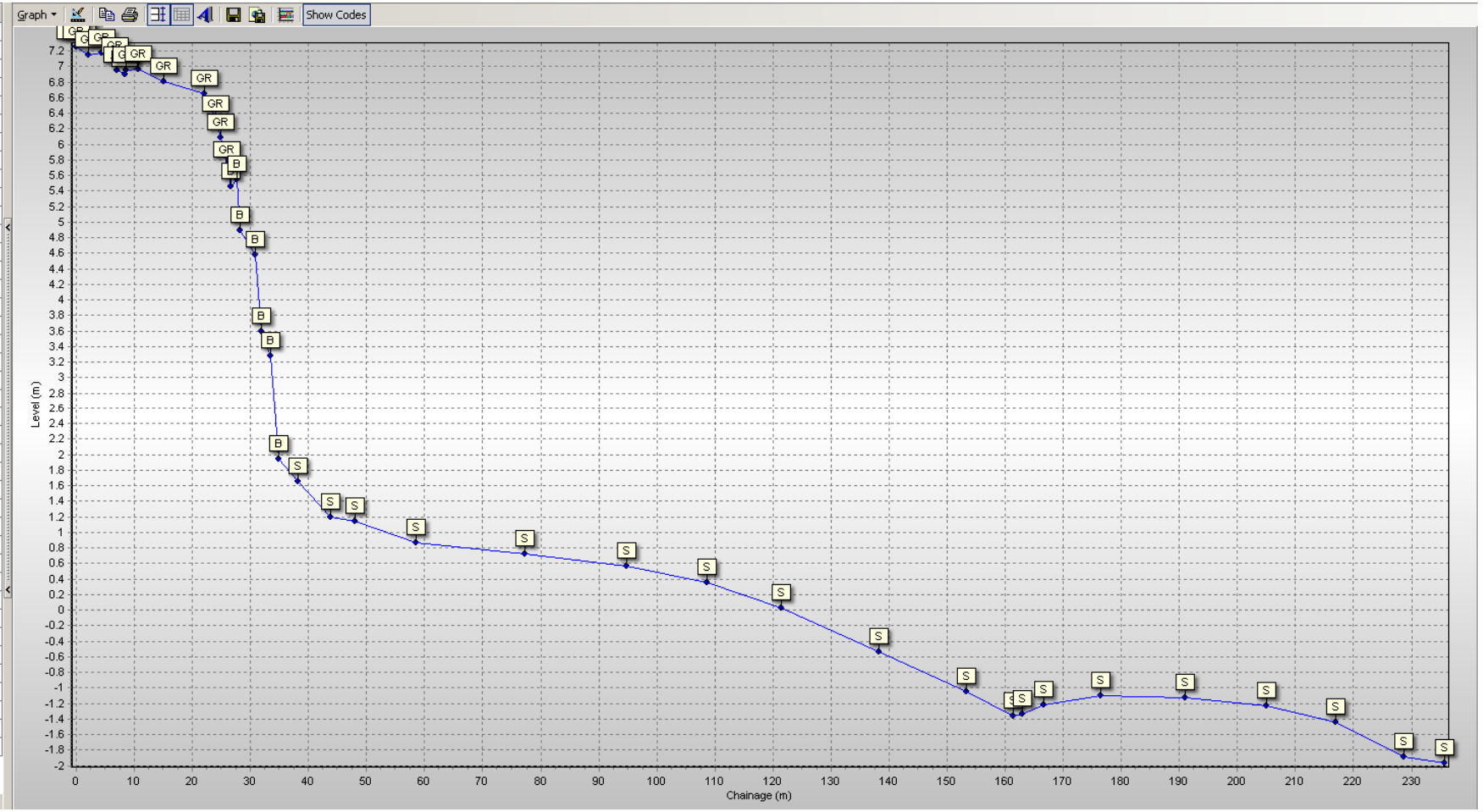
1aBTBC07 - 23/09/2010

Chainage	Level	Code
0.000	6.203	
0.031	6.203	GR
0.664	6.086	GR
1.251	5.892	GR
1.471	5.758	ZZ
3.446	5.673	ZZ
3.630	5.747	GR
4.825	5.901	GR
6.110	5.980	GR
7.906	6.166	GR
12.578	6.042	GR
15.927	6.047	GR
17.455	5.758	GR
18.475	5.900	GR
18.874	5.832	GR
19.715	5.652	GR
20.234	5.364	GR
20.657	5.314	GR
21.065	5.765	B
22.086	5.420	B
23.165	4.677	B
25.347	4.173	B
26.766	2.827	B
28.681	1.893	B
32.608	1.515	S
37.183	1.032	S
43.224	1.023	S
55.989	0.950	S
68.707	1.002	S
76.851	1.039	S
89.245	0.808	S
103.839	0.402	S
116.090	0.091	S
128.705	-0.302	S
140.262	-0.723	S
152.405	-1.185	S
162.397	-1.346	S
173.531	-1.628	S
177.037	-1.628	S
185.555	-1.594	S
195.763	-1.581	S
197.407	-1.465	S



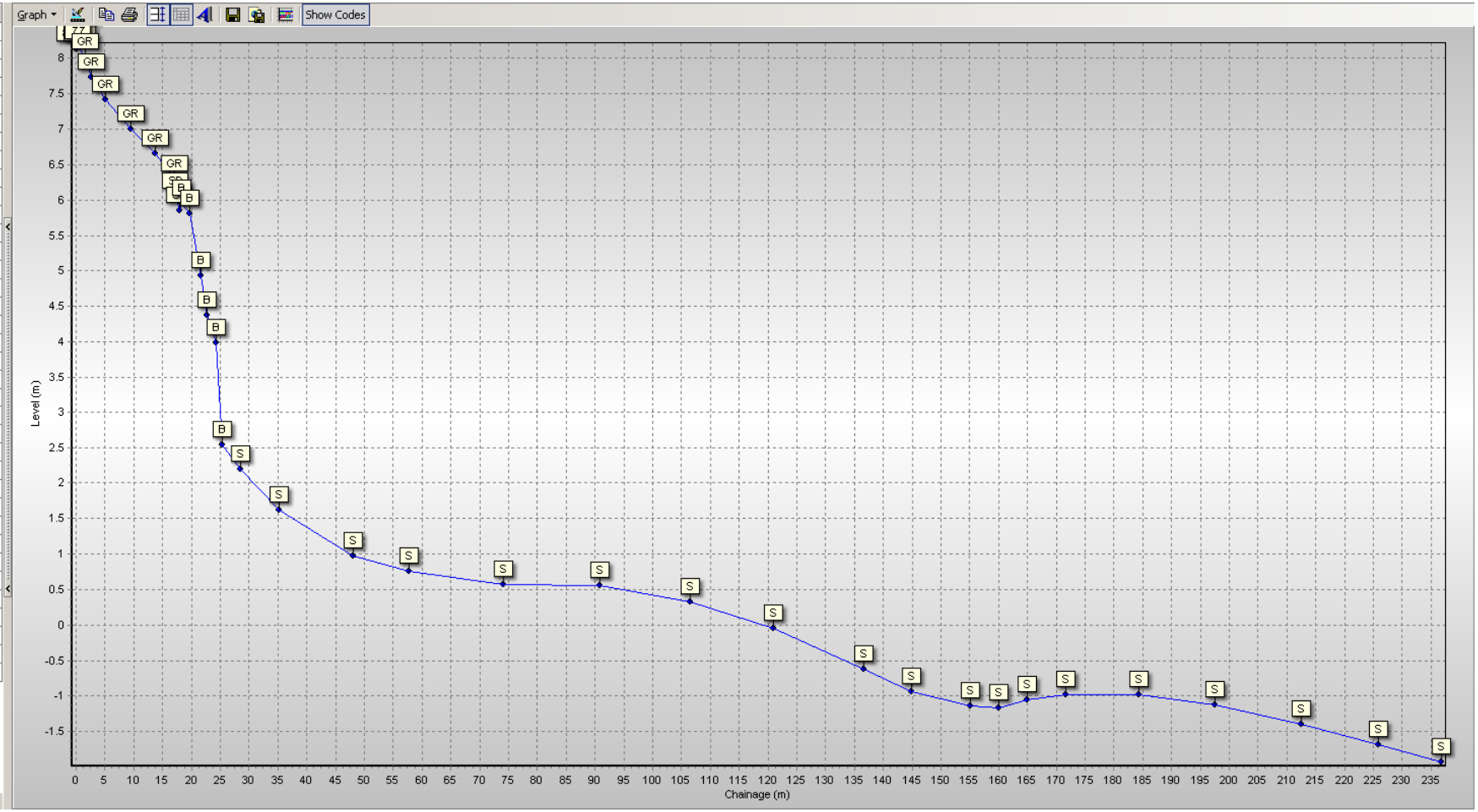
1aBTBC08 - 23/09/2010

Chainage	Level	Code
0.000	7.254	
0.032	7.254	GR
2.031	7.153	GR
4.374	7.177	GR
6.733	7.064	GR
7.064	6.950	ZZ
8.382	6.906	ZZ
8.564	6.954	GR
10.751	6.970	GR
15.079	6.813	GR
22.004	6.647	GR
23.984	6.321	GR
24.911	6.091	GR
25.992	5.736	GR
26.593	5.461	B
27.616	5.550	B
28.249	4.896	B
30.922	4.582	B
31.978	3.596	B
33.499	3.282	B
34.914	1.937	B
38.128	1.652	S
43.851	1.201	S
48.034	1.142	S
58.466	0.873	S
77.297	0.729	S
94.802	0.567	S
108.687	0.351	S
121.412	0.033	S
138.294	-0.537	S
153.262	-1.046	S
161.477	-1.364	S
163.008	-1.339	S
166.609	-1.218	S
176.549	-1.099	S
190.924	-1.132	S
204.979	-1.225	S
216.919	-1.447	S
228.678	-1.892	S
235.695	-1.966	S



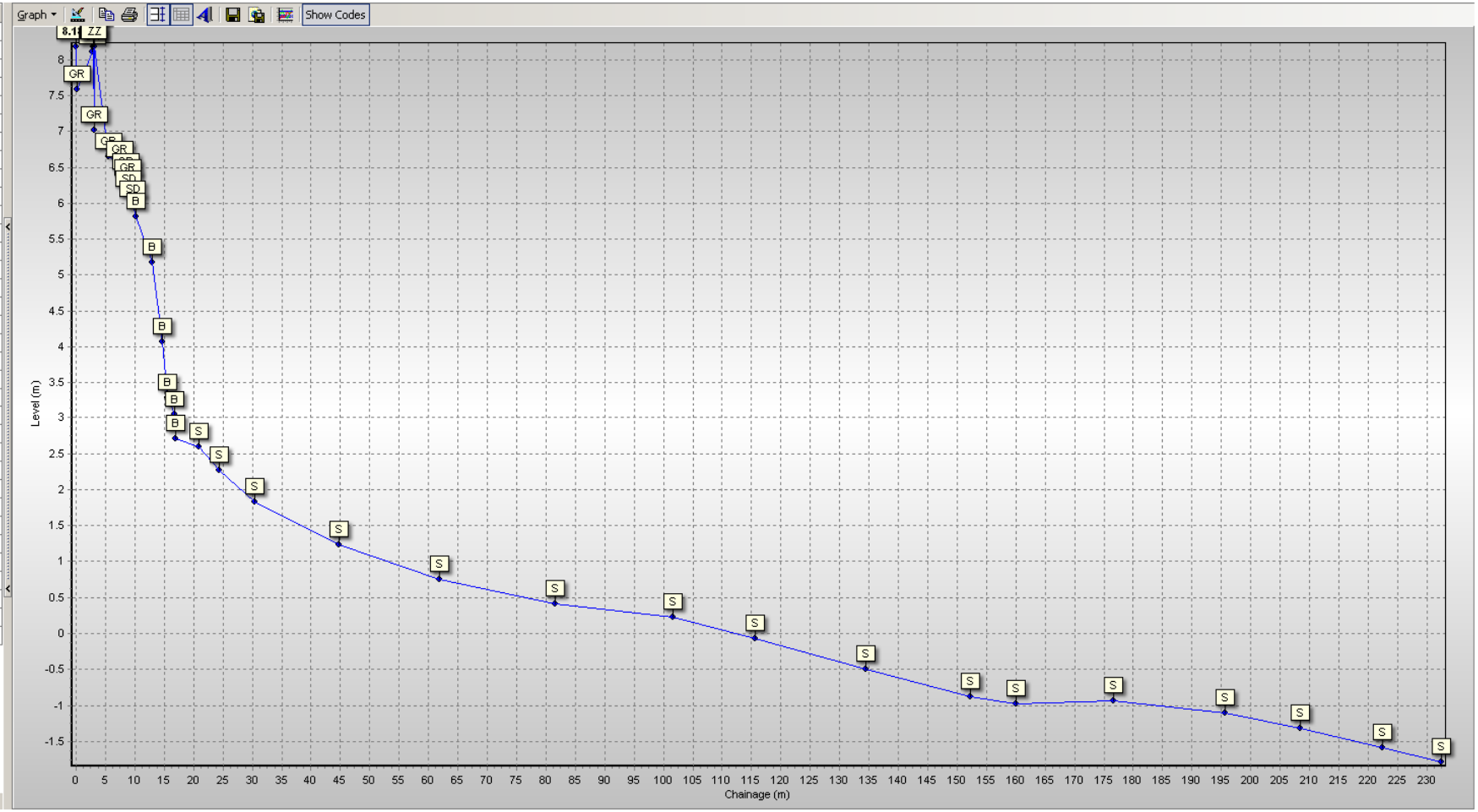
1aBTBC09 - 23/09/2010

Chainage	Level	Code
0.000	8.138	
0.109	8.138	ZZ
0.306	8.164	ZZ
1.554	8.022	GR
2.673	7.733	GR
5.166	7.413	GR
9.480	6.999	GR
13.666	6.660	GR
16.992	6.297	GR
17.219	6.060	SD
18.021	5.846	SD
18.236	5.958	B
19.754	5.804	B
21.616	4.928	B
22.685	4.369	B
24.346	3.989	B
25.315	2.540	B
28.542	2.198	S
35.275	1.614	S
48.146	0.968	S
57.735	0.750	S
74.047	0.564	S
90.827	0.549	S
106.497	0.328	S
120.913	-0.048	S
136.643	-0.623	S
144.865	-0.931	S
155.173	-1.142	S
160.019	-1.165	S
164.970	-1.055	S
171.625	-0.980	S
184.256	-0.981	S
197.514	-1.127	S
212.584	-1.392	S
225.835	-1.680	S
236.803	-1.928	S



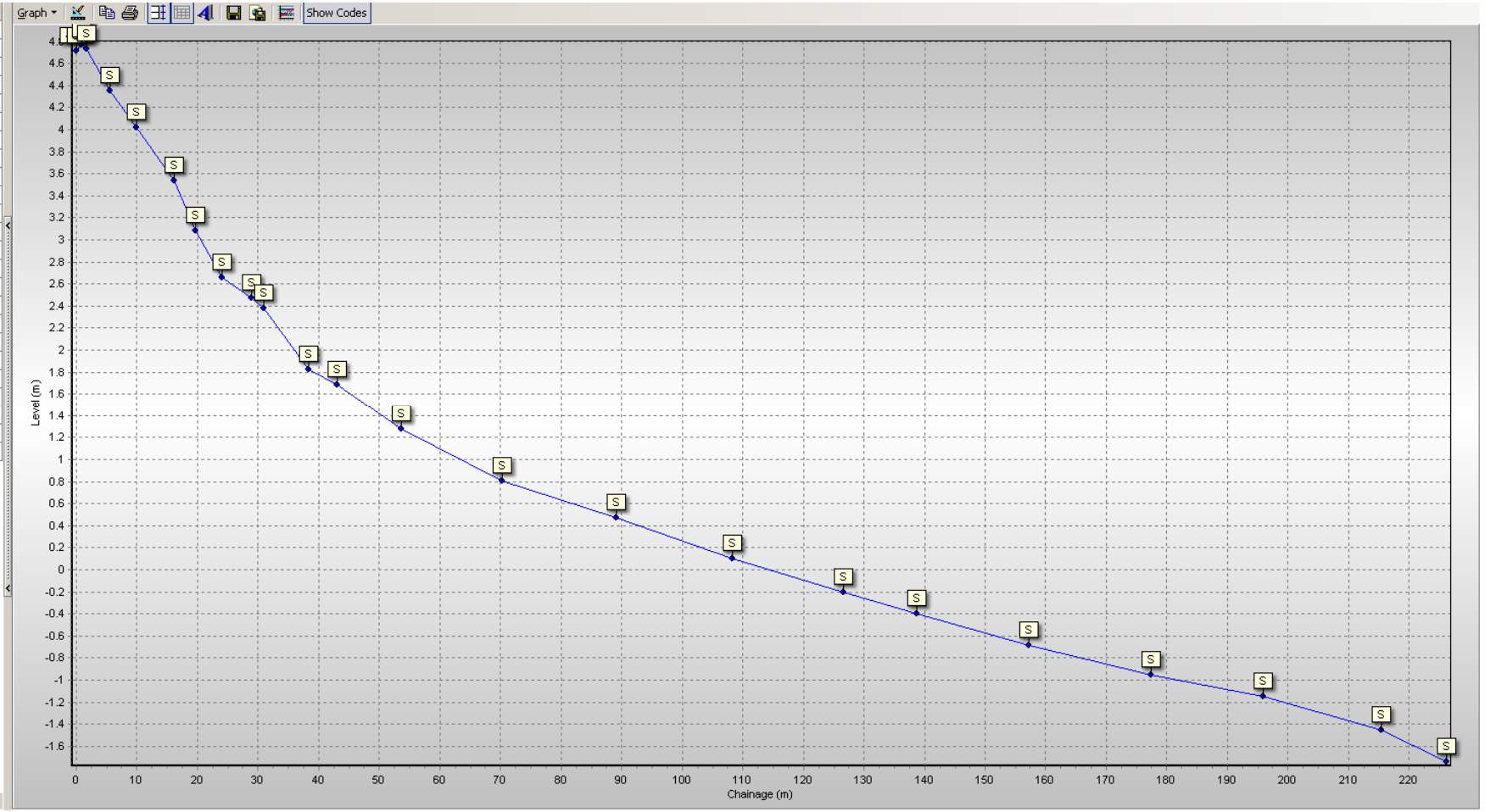
1aBTBC10 - 23/09/2010

Chainage	Level	Code
0.000	8.182	
0.253	7.586	GR
2.715	8.116	GR
2.978	8.179	ZZ
3.064	7.022	GR
3.104	8.182	ZZ
5.544	6.654	GR
7.379	6.540	GR
8.510	6.368	GR
8.849	6.276	GR
9.015	6.126	SD
9.598	5.979	SD
10.154	5.808	B
13.006	5.179	B
14.683	4.070	B
15.609	3.292	B
16.768	3.044	B
16.870	2.707	B
20.989	2.600	S
24.300	2.274	S
30.398	1.832	S
44.826	1.230	S
61.879	0.751	S
81.579	0.406	S
101.625	0.224	S
115.683	-0.074	S
134.444	-0.499	S
152.196	-0.884	S
159.985	-0.985	S
176.701	-0.939	S
195.614	-1.110	S
208.501	-1.319	S
222.476	-1.589	S
232.469	-1.787	S



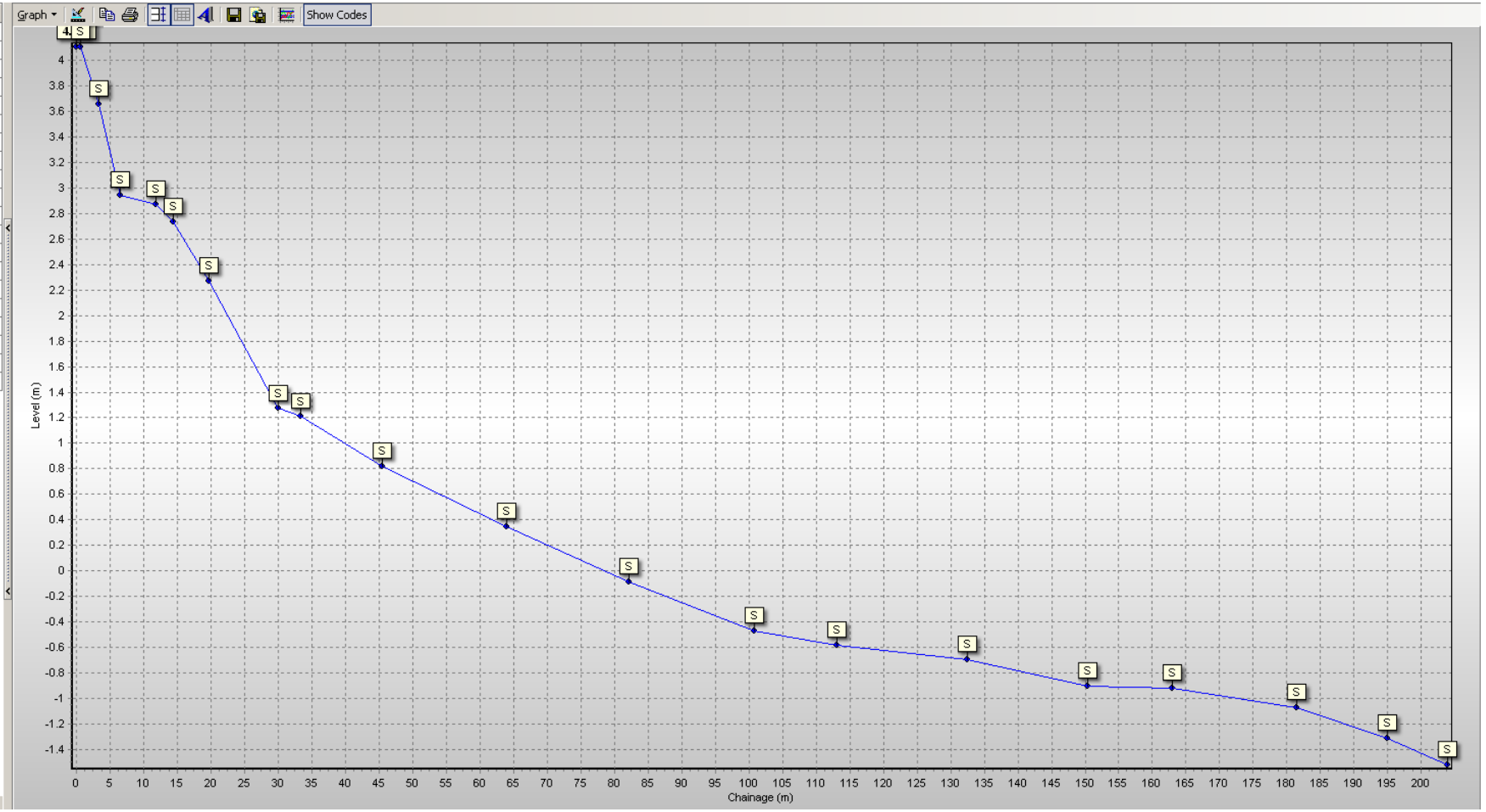
1aBTBC11 - 23/09/2010

Chainage	Level	Code
0.000	4.710	
0.079	4.710	S
0.847	4.769	S
1.663	4.730	S
5.524	4.354	S
9.968	4.022	S
16.144	3.536	S
19.650	3.082	S
23.973	2.661	S
28.999	2.473	S
31.013	2.381	S
38.421	1.826	S
42.967	1.684	S
53.573	1.275	S
70.238	0.804	S
89.160	0.473	S
108.225	0.105	S
126.555	-0.205	S
138.684	-0.399	S
157.249	-0.684	S
177.408	-0.952	S
195.897	-1.147	S
215.417	-1.450	S
226.174	-1.741	S



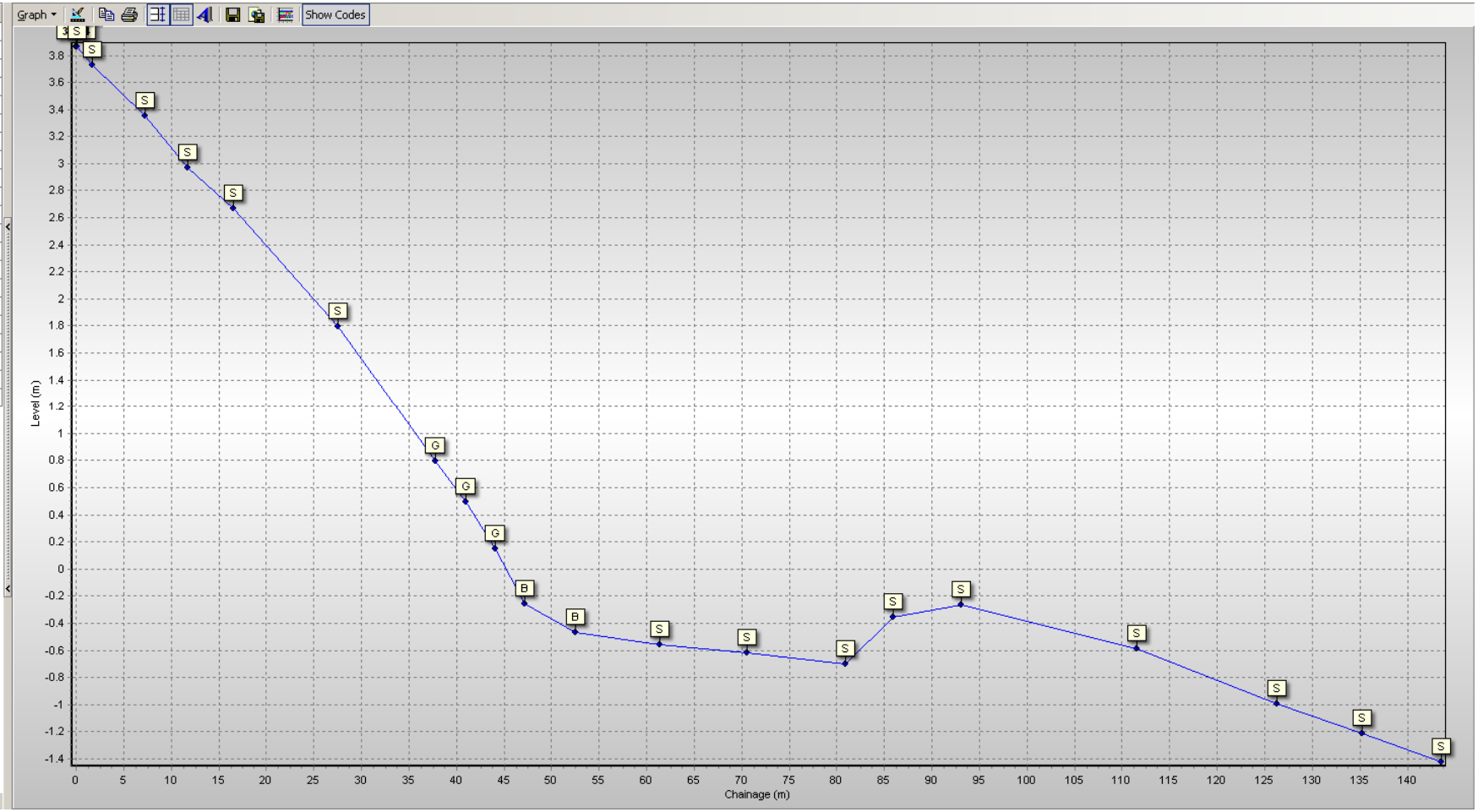
1aBTBC12 - 23/09/2010

Chainage	Level	Code
0.000	4.102	
0.548	4.102	S
3.308	3.652	S
6.590	2.940	S
11.832	2.871	S
14.470	2.735	S
19.670	2.269	S
30.035	1.270	S
33.373	1.206	S
45.518	0.812	S
63.976	0.338	S
82.191	-0.087	S
100.863	-0.476	S
113.111	-0.585	S
132.515	-0.701	S
150.356	-0.907	S
162.996	-0.926	S
181.513	-1.072	S
195.016	-1.314	S
203.890	-1.522	S



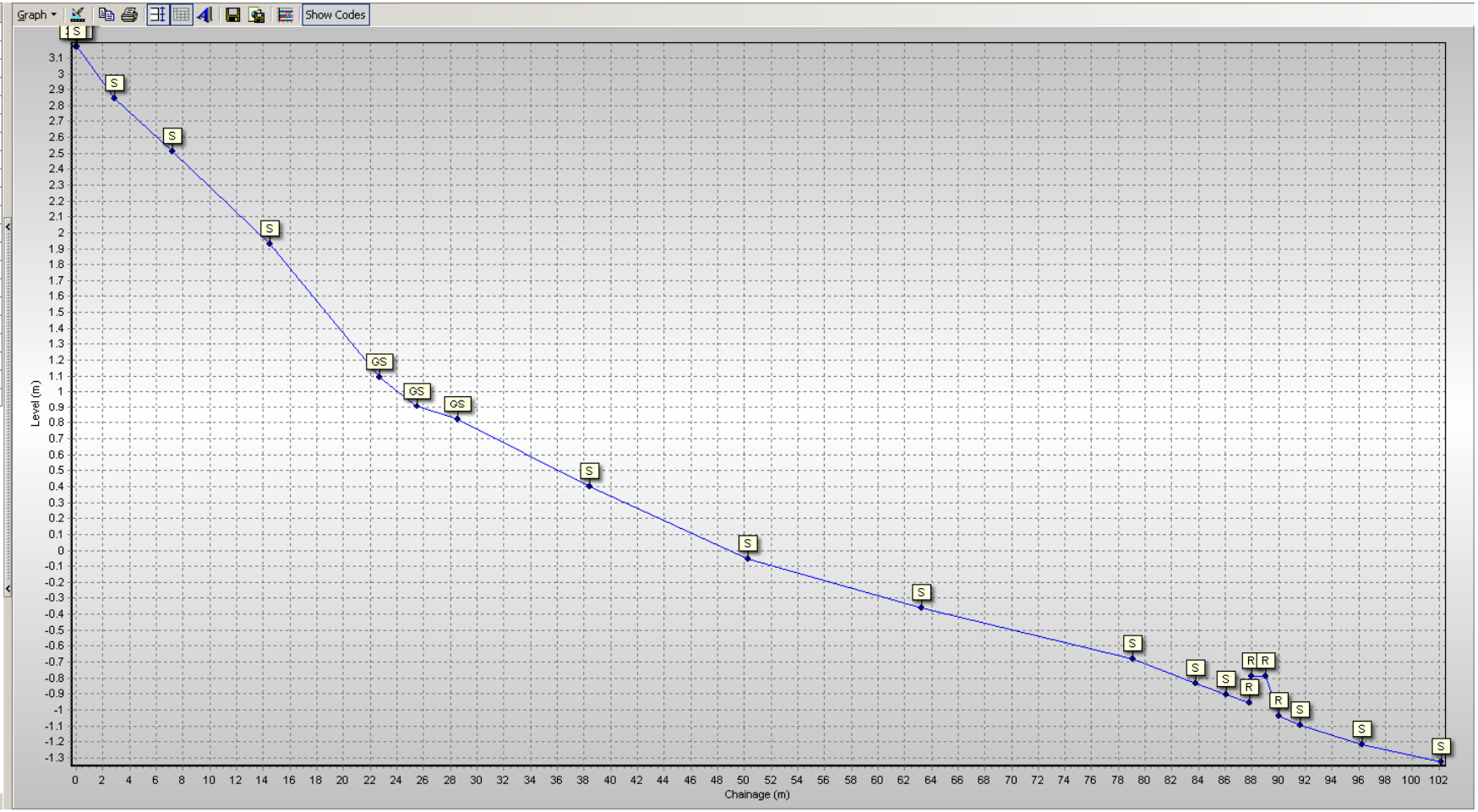
1aBTBC13 - 23/09/2010

Chainage	Level	Code
0.000	3.864	
0.065	3.864	S
1.733	3.727	S
7.293	3.350	S
11.790	2.972	S
16.567	2.668	S
27.576	1.798	S
37.741	0.799	G
41.043	0.496	G
44.134	0.151	G
47.209	-0.261	B
52.480	-0.468	B
61.366	-0.557	S
70.611	-0.622	S
80.920	-0.699	S
85.975	-0.355	S
93.124	-0.264	S
111.513	-0.591	S
126.259	-0.995	S
135.257	-1.210	S
143.574	-1.423	S



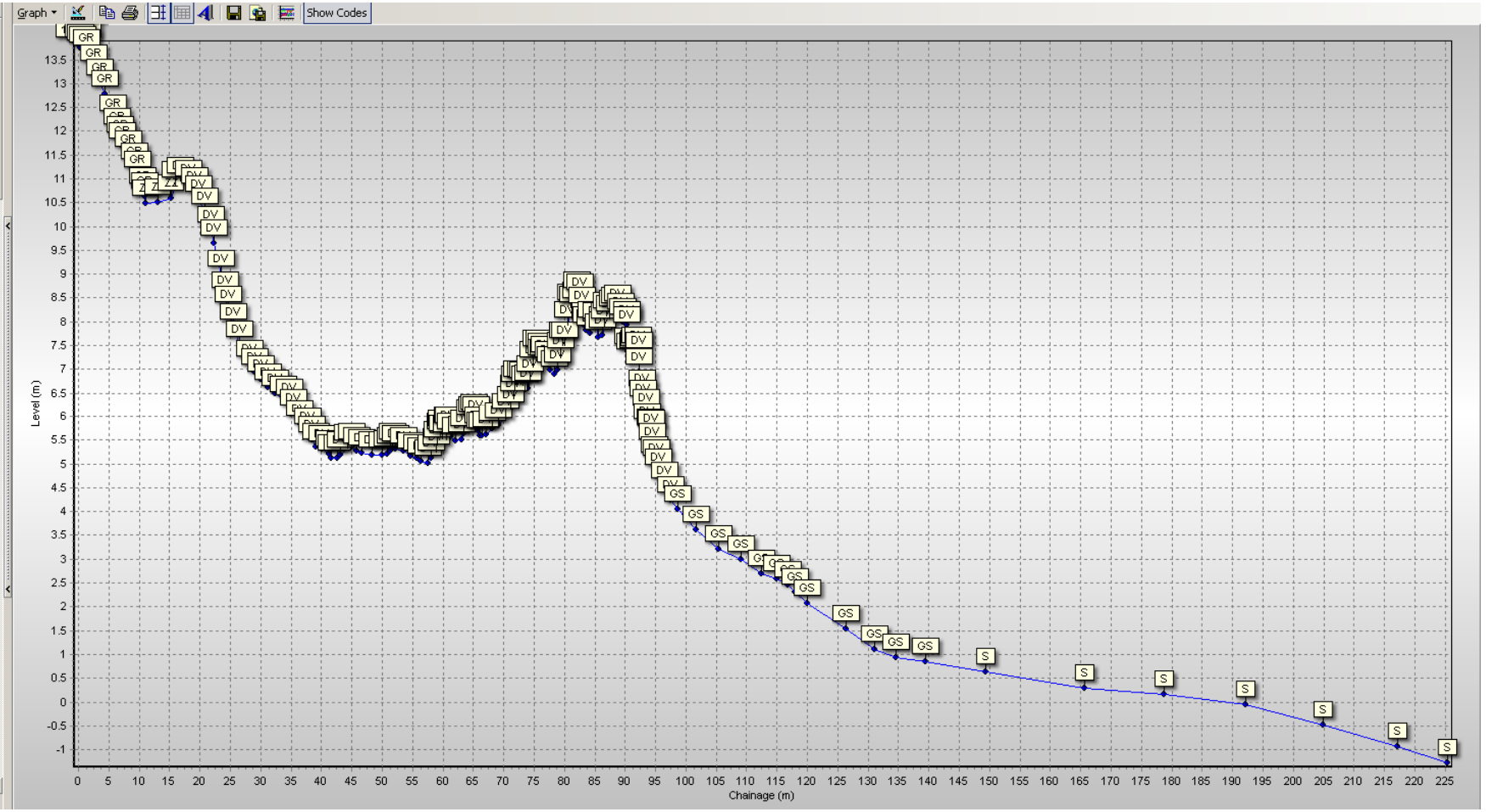
1aBTBC14 - 23/09/2010

Chainage	Level	Code
0.000	3.170	
0.106	3.170	S
2.874	2.843	S
7.251	2.513	S
14.532	1.927	S
22.690	1.092	GS
25.520	0.908	GS
28.585	0.822	GS
38.451	0.402	S
50.275	-0.051	S
63.296	-0.363	S
79.098	-0.680	S
83.787	-0.834	S
86.053	-0.907	S
87.845	-0.956	R
87.981	-0.787	R
89.020	-0.787	R
89.992	-1.036	R
91.623	-1.094	S
96.275	-1.221	S
102.169	-1.327	S



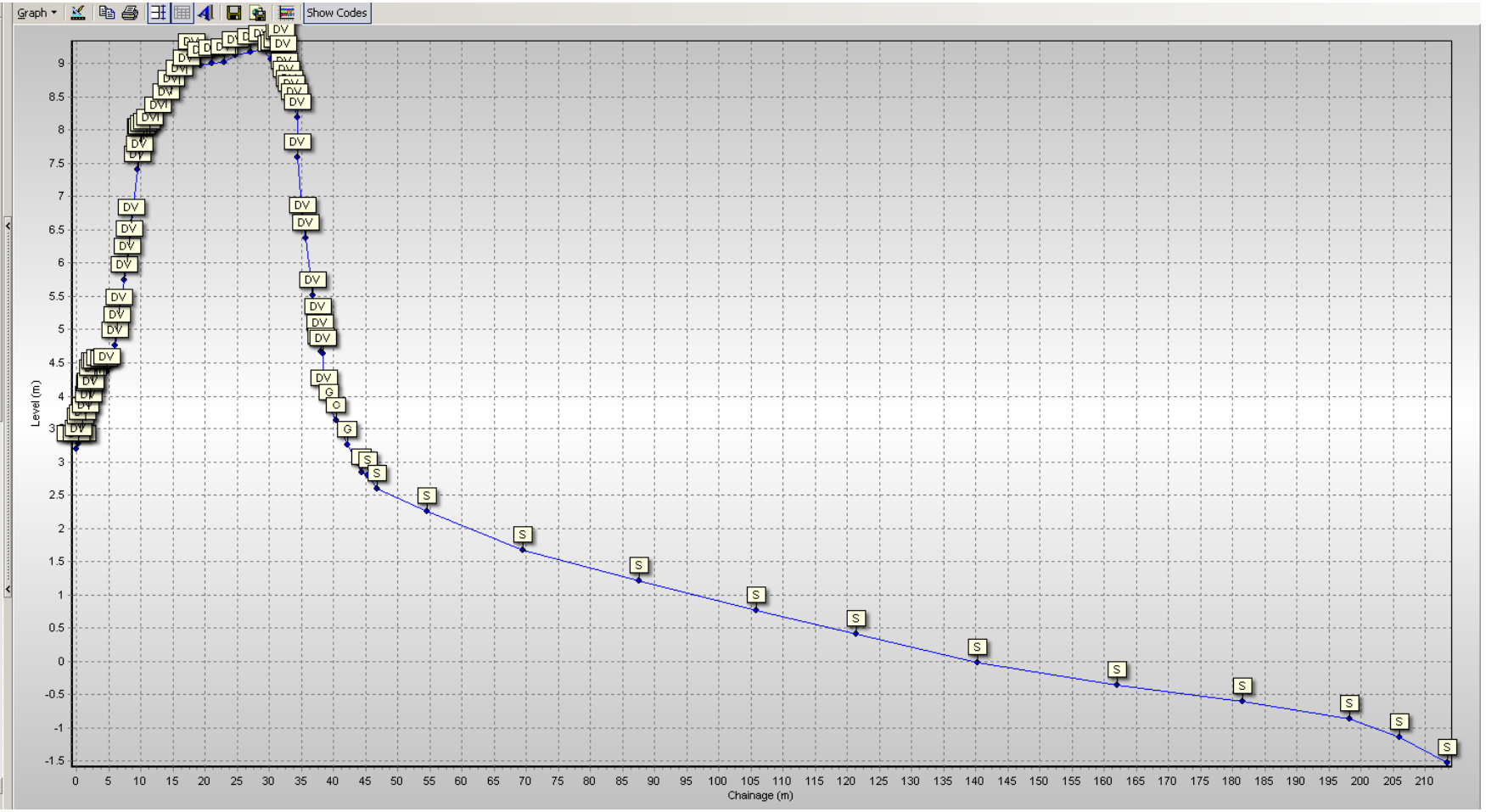
1aBTBC15 - 12/10/2010

Chainage	Level	Code
0.000	13.812	
0.055	13.812	GR
0.259	13.752	GR
0.637	13.711	GR
1.400	13.637	GR
2.448	13.320	GR
3.577	13.015	GR
4.375	12.784	GR
5.729	12.265	GR
6.440	11.980	GR
6.880	11.812	GR
7.250	11.688	GR
8.173	11.526	GR
9.309	11.253	GR
9.734	11.089	GR
10.568	10.736	GR
10.918	10.645	GR
11.038	10.479	ZZ
13.061	10.499	ZZ
15.273	10.603	ZZ
15.979	10.868	DV
16.774	10.964	DV
18.158	10.892	DV
19.065	10.744	DV
19.820	10.580	DV
20.876	10.307	DV
21.747	9.922	DV
22.390	9.649	DV
23.444	9.006	DV
24.163	8.553	DV
24.728	8.248	DV
25.501	7.885	DV
26.518	7.527	DV
28.130	7.109	DV
29.005	6.935	DV
30.056	6.799	DV
31.219	6.625	DV
32.383	6.488	DV
33.666	6.361	DV
34.743	6.295	DV
35.341	6.085	DV
36.397	5.853	DV



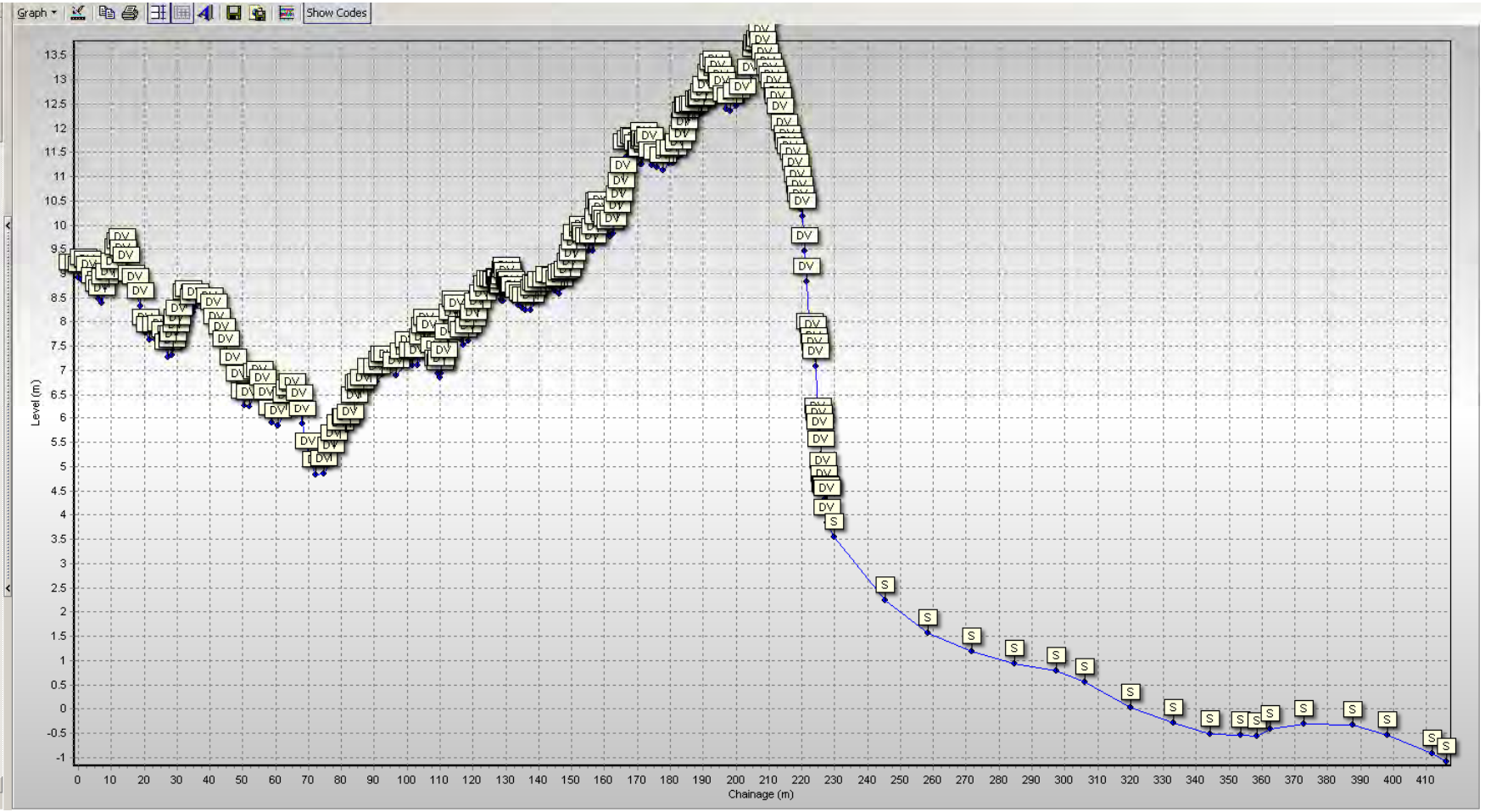
1aBTBC16 - 12/10/2010

Chainage	Level	Code
0.000	3.191	
0.036	3.191	DV
0.304	3.267	DV
0.645	3.455	DV
1.011	3.522	DV
1.426	3.622	DV
1.865	3.798	DV
2.038	3.959	DV
2.279	3.989	DV
2.545	4.196	DV
2.863	4.297	DV
3.156	4.307	DV
3.698	4.339	DV
4.318	4.326	DV
4.739	4.364	DV
6.006	4.761	DV
6.380	4.985	DV
6.721	5.250	DV
7.426	5.742	DV
7.875	6.028	DV
8.280	6.277	DV
8.562	6.610	DV
9.523	7.404	DV
9.796	7.555	DV
9.953	7.814	DV
10.095	7.816	DV
10.453	7.867	DV
11.021	7.903	DV
11.450	7.959	DV
12.718	8.146	DV
13.988	8.347	DV
14.773	8.540	DV
16.021	8.696	DV
17.172	8.856	DV
17.881	9.104	DV
19.354	8.975	DV
21.068	8.998	DV
23.082	9.017	DV
24.694	9.120	DV
27.193	9.175	DV
28.838	9.212	DV
30.302	9.071	DV



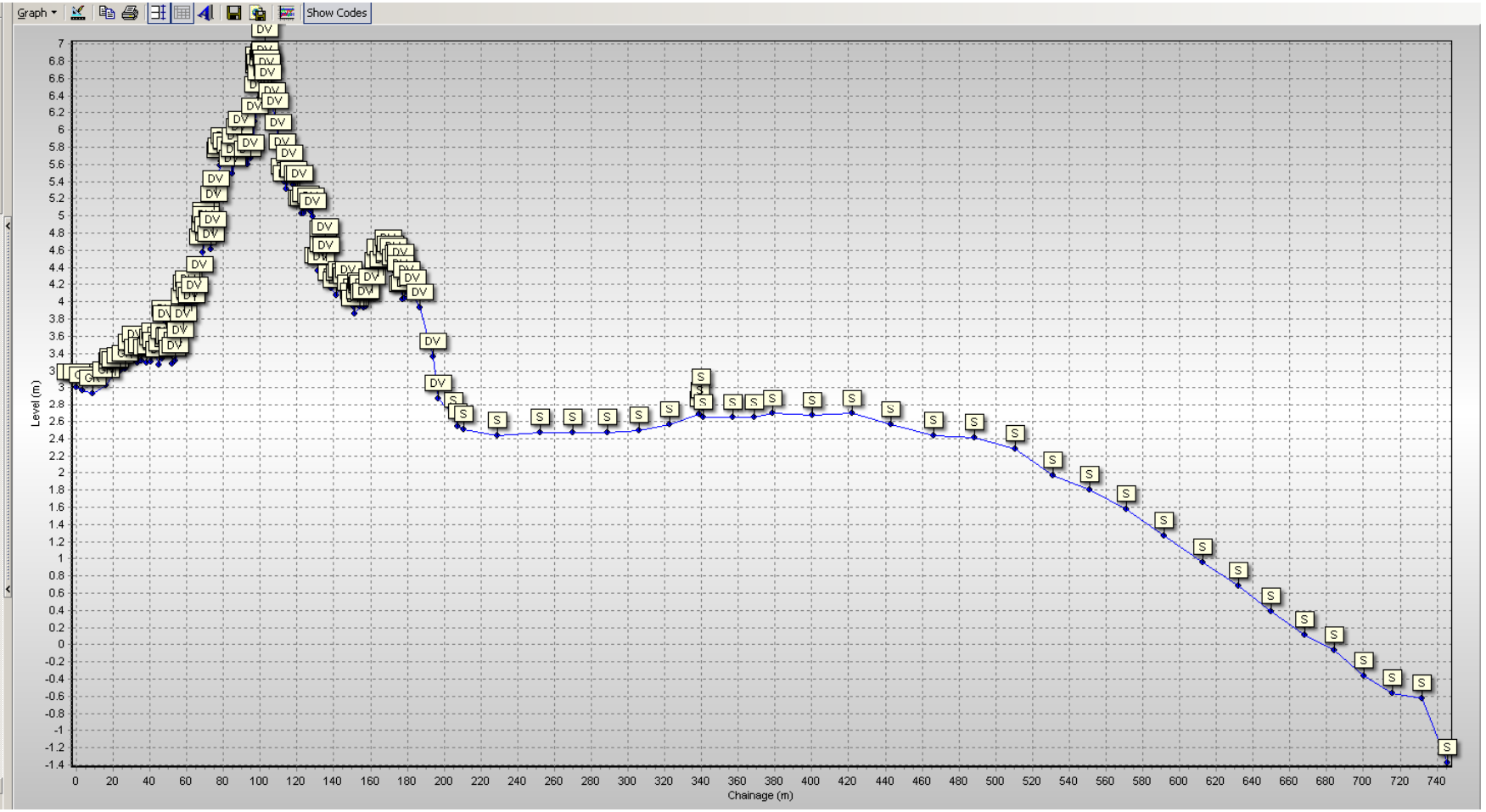
1aBTBC17 - 12/10/2010

Chainage	Level	Code
0.000	8.926	
0.034	8.926	DV
0.892	8.877	DV
1.652	9.020	DV
2.747	8.974	DV
3.561	8.883	DV
4.880	8.644	DV
6.190	8.478	DV
7.199	8.385	DV
8.068	8.622	DV
9.247	8.721	DV
10.718	8.933	DV
12.227	9.238	DV
12.568	9.362	DV
13.172	9.438	DV
13.608	9.209	DV
14.607	9.073	DV
16.057	8.689	DV
17.496	8.616	DV
18.863	8.318	DV
20.504	7.785	DV
21.649	7.641	DV
23.539	7.632	DV
24.945	7.646	DV
26.198	7.525	DV
27.245	7.270	DV
28.434	7.325	DV
28.882	7.433	DV
29.867	7.636	DV
30.128	7.779	DV
30.680	7.960	DV
32.691	8.307	DV
33.457	8.358	DV
34.999	8.191	DV
35.785	8.312	DV
39.839	8.217	DV
41.085	8.095	DV
42.242	7.799	DV
43.805	7.595	DV
45.025	7.344	DV
47.011	6.961	DV
48.817	6.628	DV



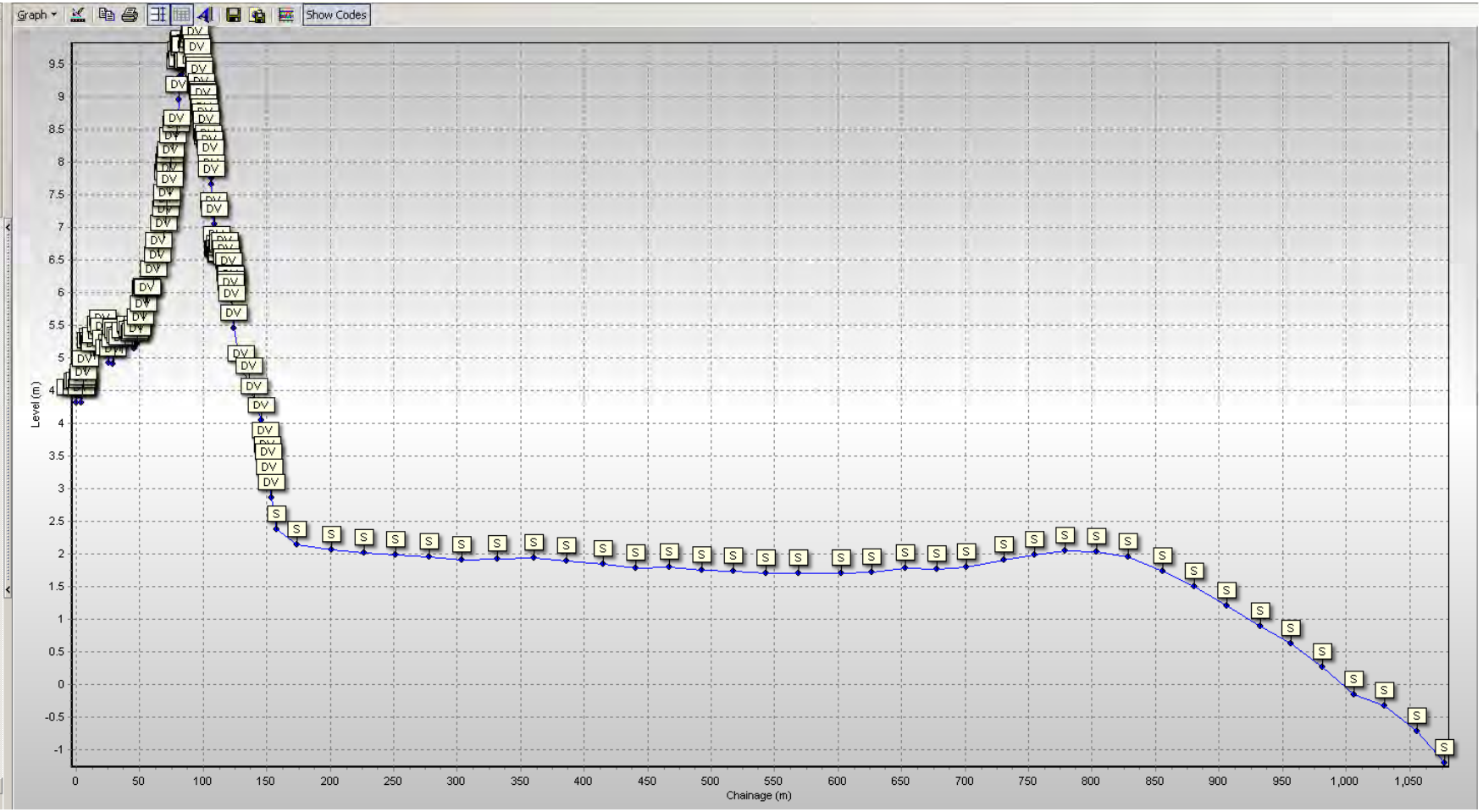
1aBTBC18 - 29/09/2010

Chainage	Level	Code
0.000	3.006	
0.012	3.006	GR
3.320	2.972	GR
9.072	2.934	GR
15.917	3.028	GR
19.484	3.136	GR
20.214	3.188	GR
21.229	3.143	GR
24.053	3.194	GR
26.619	3.219	GR
29.666	3.345	DV
32.241	3.442	DV
33.416	3.295	DV
35.573	3.317	DV
38.197	3.285	DV
40.719	3.306	DV
41.391	3.411	DV
42.639	3.485	DV
43.354	3.371	DV
45.029	3.270	DV
46.750	3.340	DV
47.639	3.483	DV
48.043	3.737	DV
48.687	3.685	DV
50.384	3.425	DV
51.403	3.415	DV
52.241	3.278	DV
53.943	3.310	DV
56.592	3.494	DV
58.138	3.682	DV
58.957	3.883	DV
60.149	4.037	DV
60.856	4.089	DV
61.660	3.956	DV
62.667	3.897	DV
64.430	4.021	DV
67.209	4.254	DV
68.940	4.569	DV
69.630	4.734	DV
70.157	4.878	DV
70.696	4.839	DV
71.631	4.714	DV



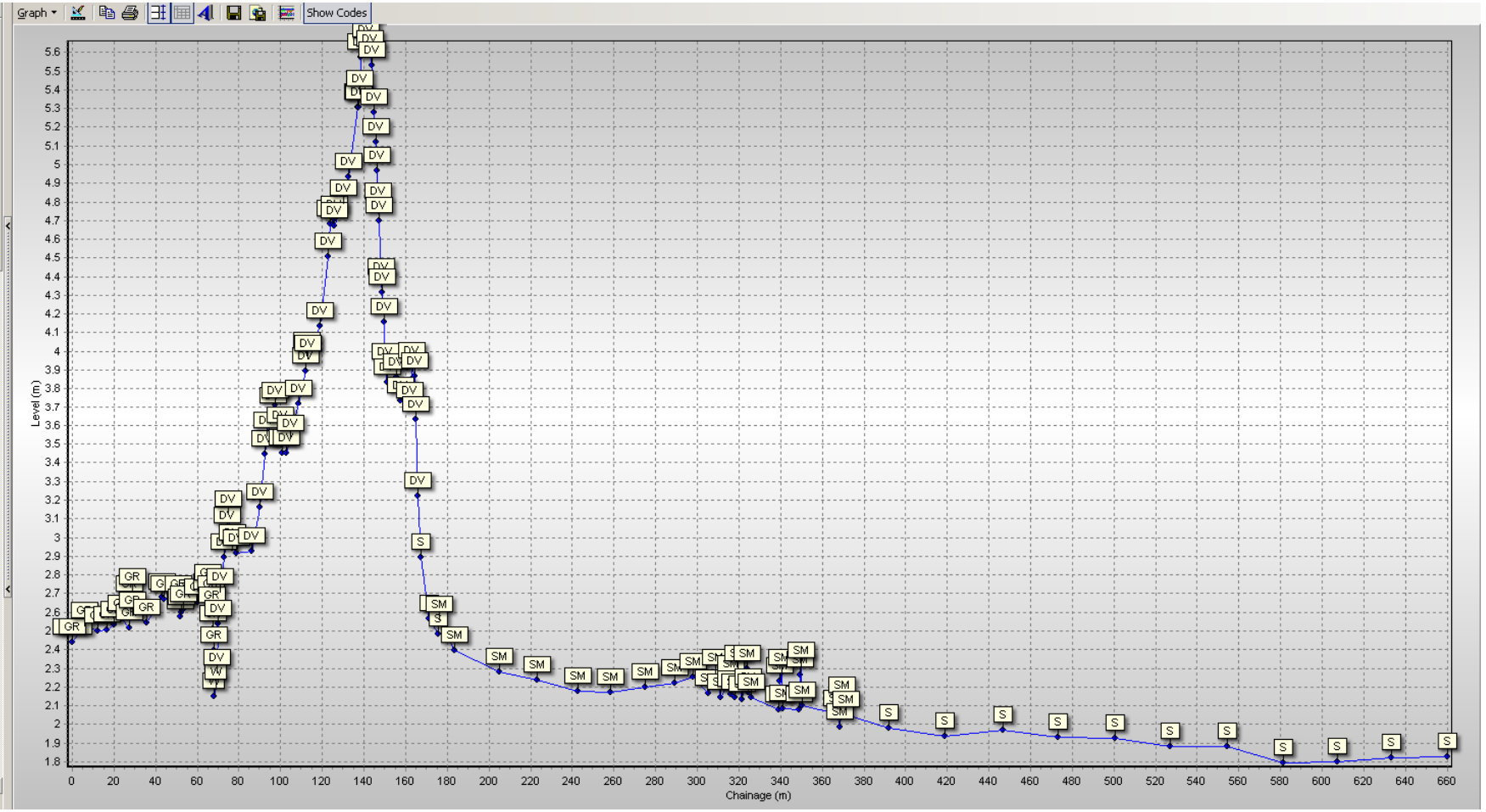
1aBTBC19 - 29/09/2010

Chainage	Level	Code
0.000	4.327	
0.047	4.327	DV
1.122	4.421	DV
2.509	4.425	DV
4.218	4.321	DV
4.919	4.426	DV
5.009	4.469	DV
5.595	4.552	DV
7.084	4.753	DV
11.440	5.036	DV
12.855	5.096	DV
13.414	5.039	DV
14.049	4.986	DV
15.477	5.118	DV
19.360	5.289	DV
20.833	5.374	DV
21.938	5.256	DV
23.316	5.070	DV
25.722	4.934	DV
28.571	4.914	DV
30.096	5.054	DV
31.429	5.233	DV
33.108	5.201	DV
34.261	5.123	DV
35.834	5.091	DV
38.264	5.201	DV
42.630	5.293	DV
44.429	5.210	DV
45.677	5.153	DV
46.659	5.185	DV
47.769	5.284	DV
48.462	5.222	DV
50.342	5.389	DV
53.074	5.606	DV
54.202	5.830	DV
55.127	5.865	DV
56.008	5.853	DV
60.924	6.123	DV
63.841	6.344	DV
65.202	6.561	DV
69.117	6.827	DV
70.631	7.048	DV



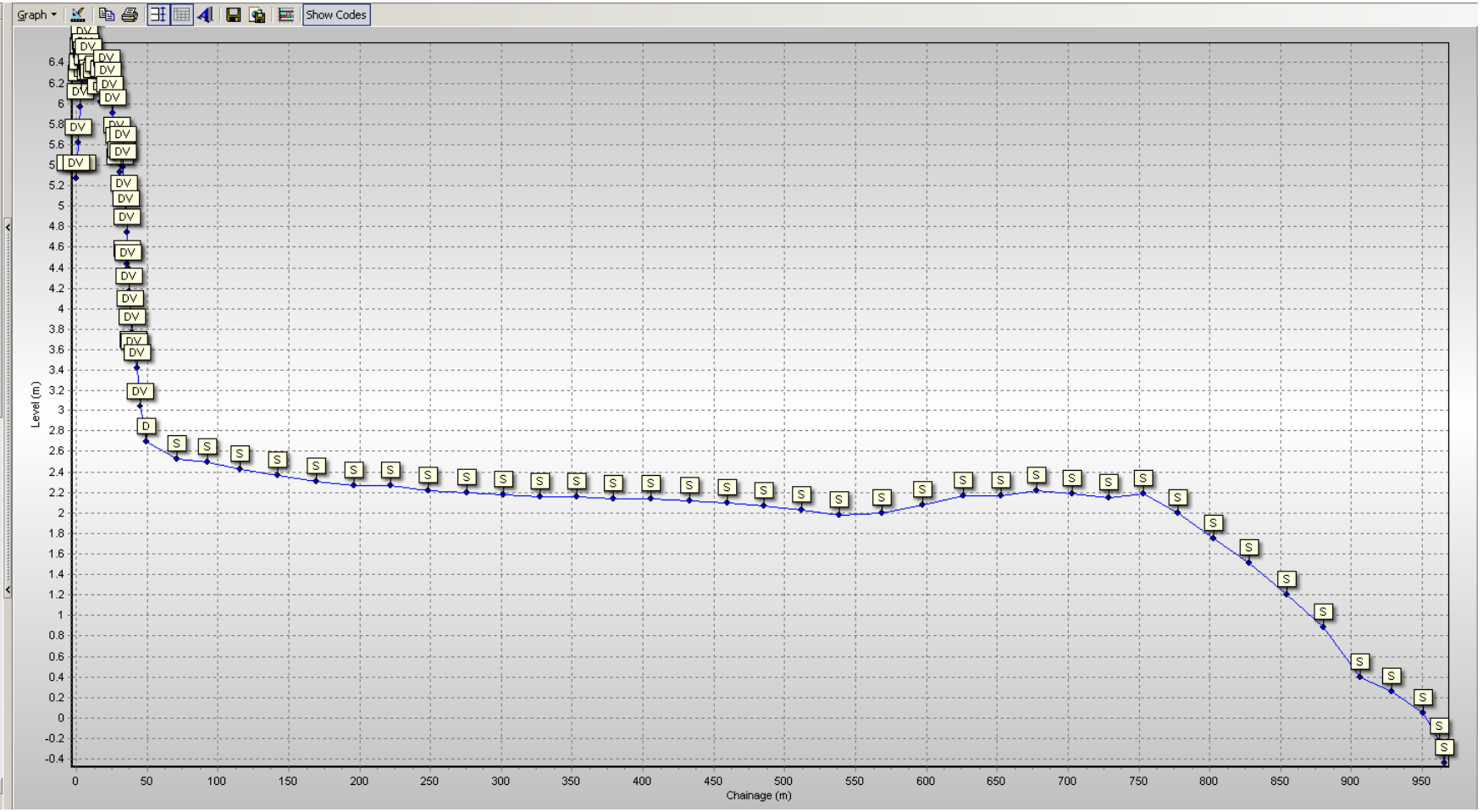
1aBTBC20 - 29/09/2010

Chainage	Level	Code
0.000	2.438	
0.037	2.438	GR
5.967	2.525	GR
12.316	2.502	GR
16.739	2.506	GR
19.894	2.534	GR
23.459	2.565	GR
27.190	2.517	GR
27.343	2.668	GR
28.640	2.710	GR
28.951	2.583	GR
35.772	2.546	GR
42.867	2.680	GR
43.832	2.667	GR
50.959	2.671	GR
51.907	2.574	GR
52.211	2.600	GR
53.539	2.615	GR
60.323	2.654	GR
64.565	2.680	GR
65.268	2.731	GR
66.310	2.671	GR
66.932	2.608	GR
67.729	2.511	GR
67.905	2.398	GR
68.202	2.151	W
69.035	2.200	W
69.466	2.276	DV
69.802	2.537	DV
70.910	2.709	DV
72.804	2.893	DV
74.196	3.035	DV
74.911	3.124	DV
76.683	2.941	DV
78.822	2.918	DV
86.280	2.925	DV
89.923	3.160	DV
92.551	3.444	DV
93.376	3.546	DV
96.573	3.683	DV
97.310	3.708	DV
99.725	3.570	DV



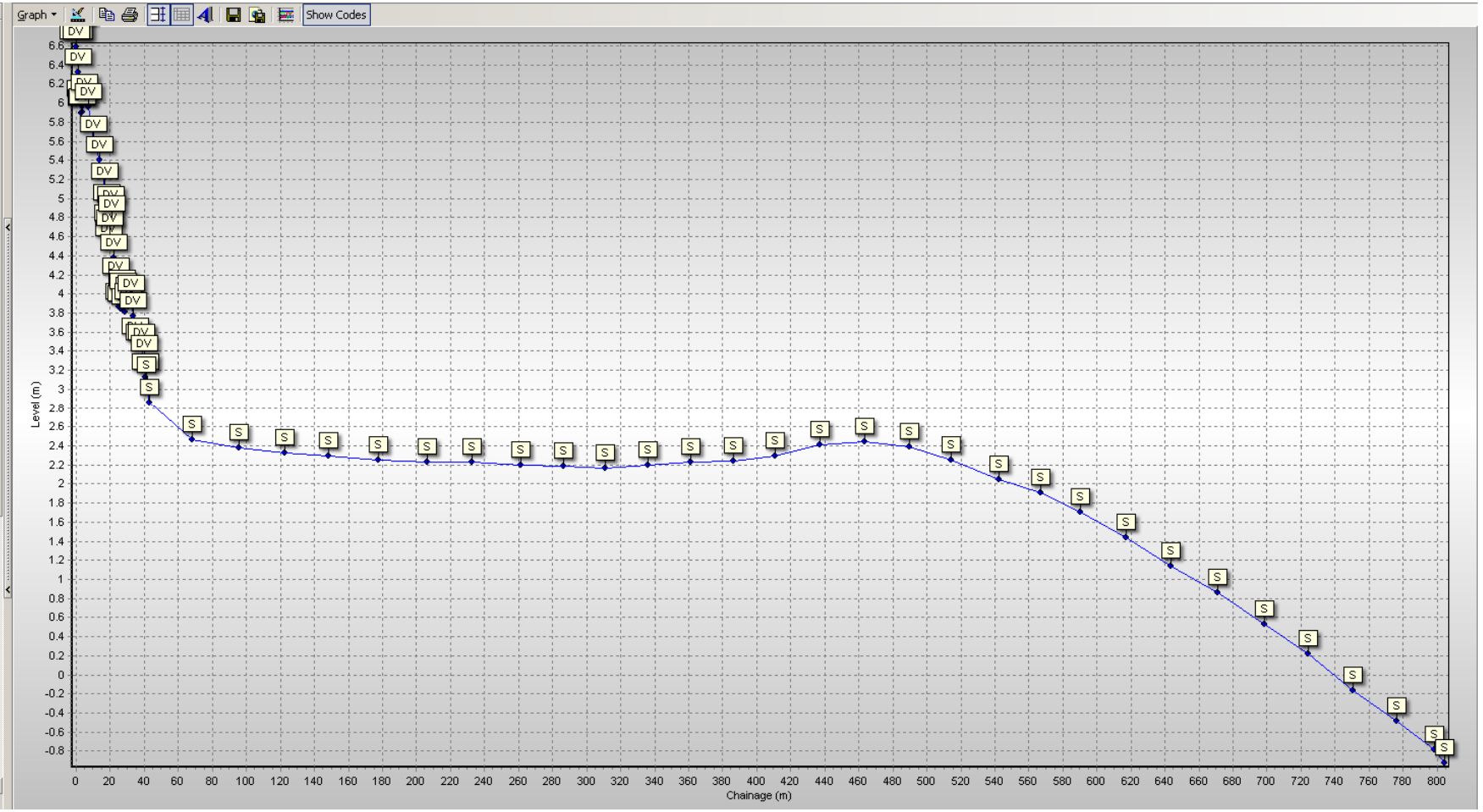
1aBTBC21 - 12/10/2010

Chainage	Level	Code
0.000	5.272	
0.038	5.272	DV
1.097	5.618	DV
2.682	5.964	DV
3.483	6.147	DV
4.149	6.255	DV
5.077	6.413	DV
5.484	6.554	DV
6.497	6.452	DV
7.469	6.373	DV
8.255	6.304	DV
8.901	6.401	DV
9.843	6.159	DV
10.913	6.259	DV
11.785	6.195	DV
12.061	6.154	DV
14.350	6.175	DV
16.036	6.234	DV
17.491	6.021	DV
19.493	6.190	DV
21.193	6.293	DV
22.073	6.177	DV
23.576	6.039	DV
25.676	5.908	DV
28.881	5.638	DV
29.804	5.536	DV
30.979	5.333	DV
31.810	5.400	DV
32.684	5.548	DV
33.204	5.385	DV
34.015	5.071	DV
34.875	4.921	DV
35.666	4.744	DV
36.174	4.434	DV
36.778	4.399	DV
37.531	4.167	DV
38.228	3.943	DV
39.345	3.767	DV
39.874	3.549	DV
40.852	3.528	DV
42.934	3.425	DV
45.521	3.042	DV



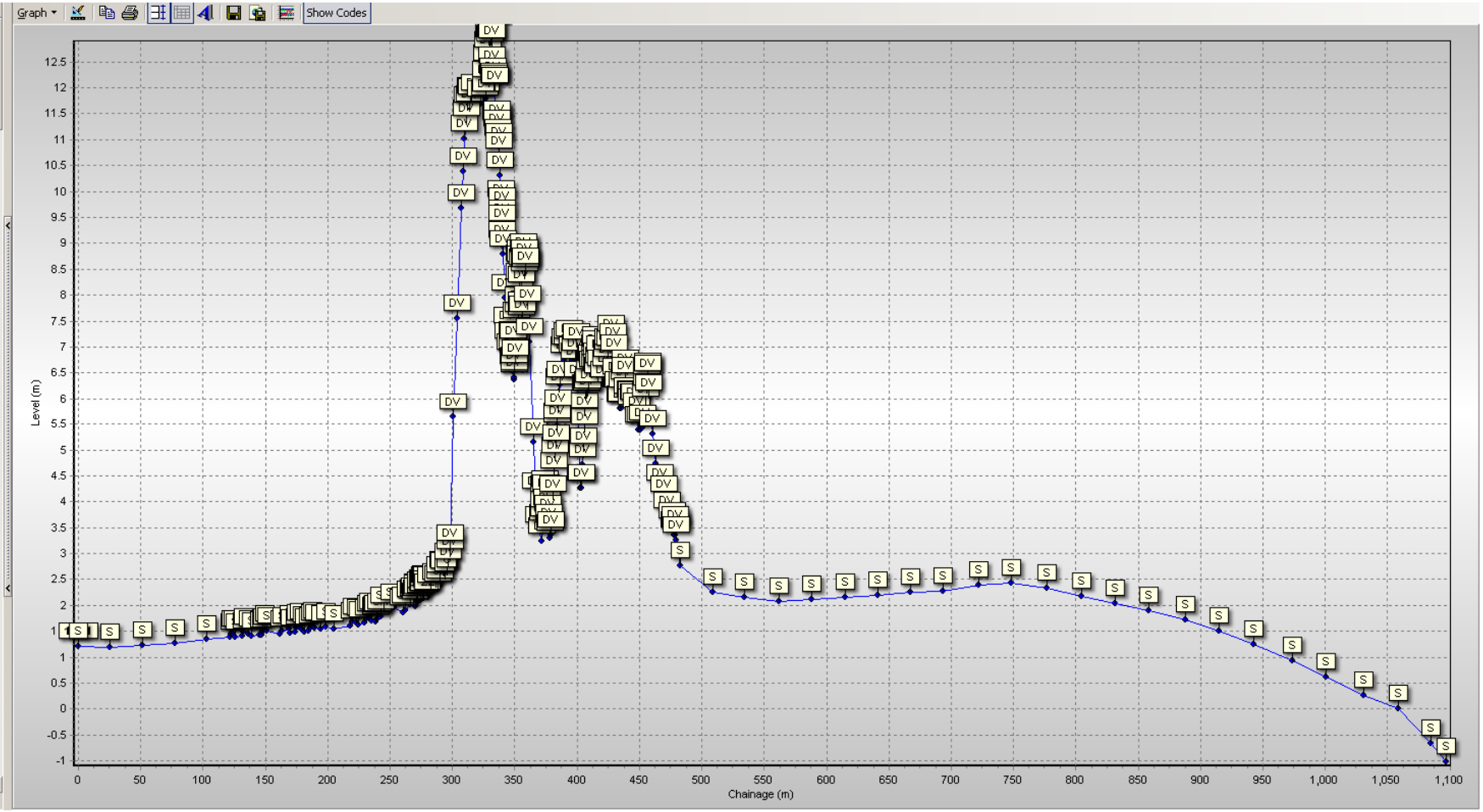
1aBTBC22 - 12/10/2010

Chainage	Level	Code
0.000	6.590	
0.030	6.590	DV
1.298	6.322	DV
2.169	5.993	DV
2.931	5.892	DV
3.789	5.910	DV
4.950	6.056	DV
7.052	5.959	DV
10.381	5.614	DV
13.568	5.399	DV
16.898	5.126	DV
17.683	4.902	DV
18.361	4.688	DV
19.177	4.529	DV
19.905	4.631	DV
20.509	4.878	DV
21.031	4.781	DV
22.102	4.382	DV
23.197	4.131	DV
25.269	3.861	DV
26.199	3.840	DV
26.773	3.999	DV
27.599	3.975	DV
28.781	3.808	DV
30.381	3.861	DV
32.059	3.954	DV
33.703	3.769	DV
34.853	3.496	DV
36.973	3.432	DV
38.532	3.442	DV
39.989	3.319	DV
40.671	3.124	DV
41.179	3.094	S
42.822	2.863	S
68.250	2.463	S
95.402	2.378	S
122.482	2.324	S
148.029	2.297	S
177.569	2.255	S
206.441	2.229	S
232.931	2.233	S
261.157	2.197	S



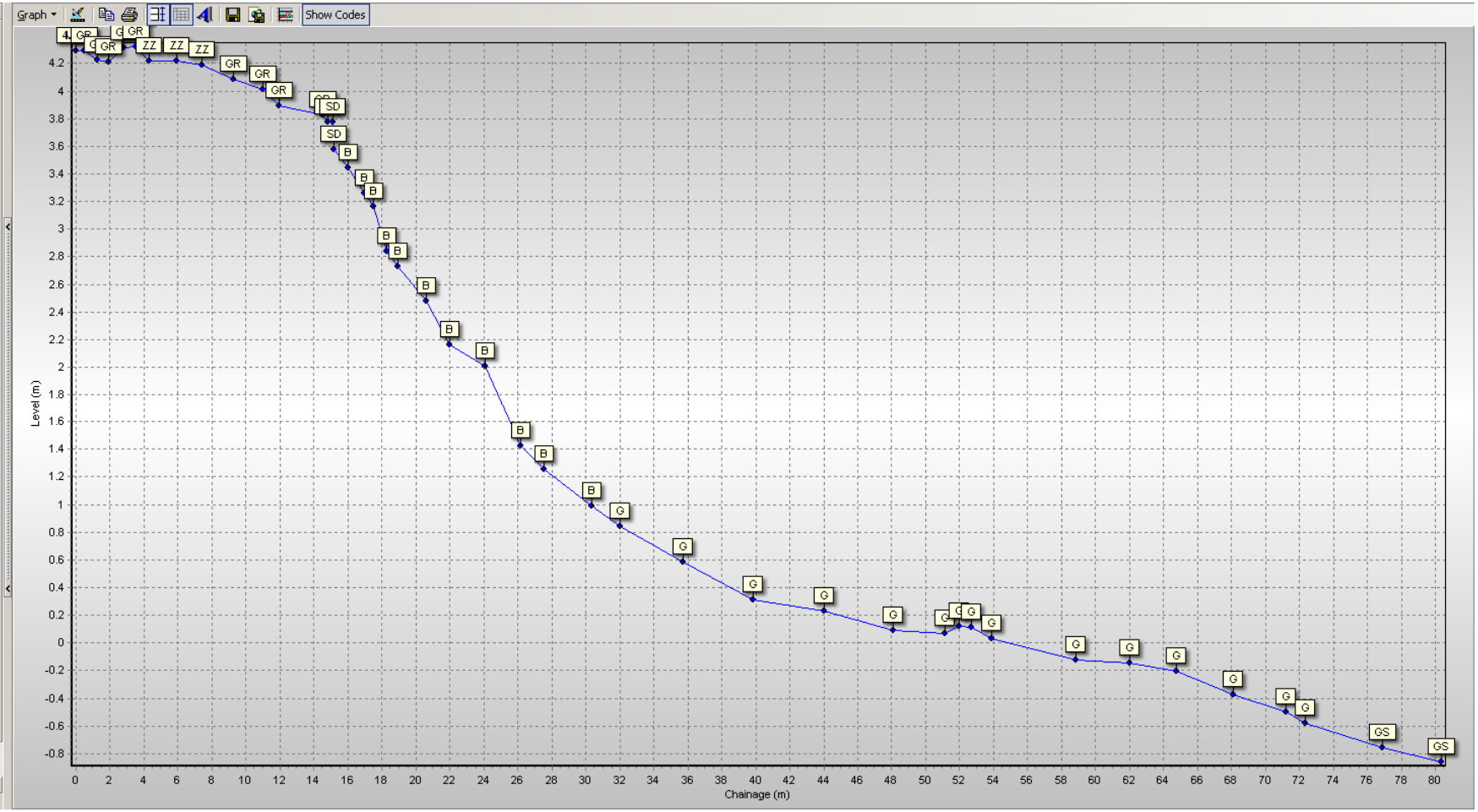
1aBTBC23 - 12/10/2010

Chainage	Level	Code
0.000	1.201	
0.027	1.201	S
25.614	1.196	S
51.559	1.229	S
77.665	1.275	S
102.931	1.343	S
121.342	1.380	S
122.405	1.452	S
124.100	1.444	S
125.940	1.397	S
131.746	1.413	S
132.611	1.492	S
136.547	1.443	S
139.044	1.405	S
145.631	1.418	S
146.878	1.432	S
147.673	1.484	S
149.127	1.545	S
150.932	1.504	S
161.528	1.442	S
163.016	1.508	S
168.765	1.546	S
170.140	1.472	S
174.076	1.487	S
175.143	1.571	S
177.225	1.584	S
179.573	1.530	S
181.549	1.492	S
184.670	1.498	S
186.208	1.565	S
187.570	1.601	S
189.222	1.571	S
194.670	1.544	S
198.331	1.591	S
204.784	1.549	S
218.413	1.599	S
220.084	1.673	S
222.874	1.671	S
224.955	1.625	S
229.669	1.658	S
231.093	1.748	S
232.881	1.789	S



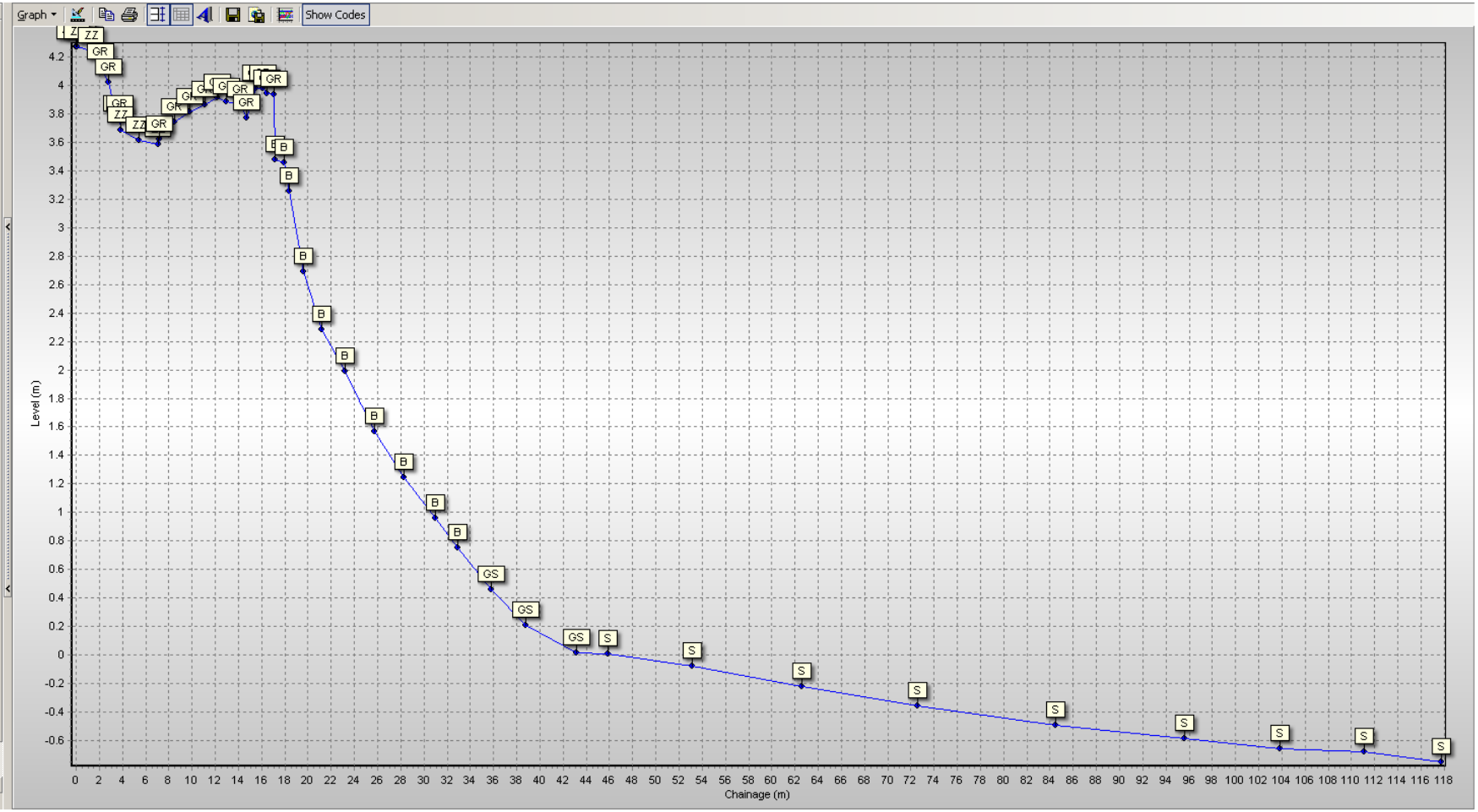
1aBTBC24 - 12/10/2010

Chainage	Level	Code
0.000	4.293	
0.454	4.293	GR
1.266	4.223	GR
1.907	4.211	GR
2.816	4.314	GR
3.546	4.321	GR
4.298	4.220	ZZ
5.896	4.215	ZZ
7.433	4.187	ZZ
9.277	4.088	GR
10.963	4.009	GR
11.964	3.891	GR
14.535	3.829	GR
14.831	3.776	SD
15.114	3.774	SD
15.204	3.574	SD
16.013	3.445	B
16.963	3.258	B
17.490	3.163	B
18.296	2.842	B
18.949	2.732	B
20.605	2.477	B
22.003	2.159	B
24.098	2.004	B
26.193	1.423	B
27.553	1.257	B
30.342	0.991	B
32.039	0.842	G
35.734	0.584	G
39.850	0.310	G
44.057	0.232	G
48.096	0.088	G
51.163	0.071	G
51.955	0.123	G
52.676	0.113	G
53.903	0.029	G
58.840	-0.122	G
61.995	-0.144	G
64.749	-0.203	G
68.092	-0.370	G
71.212	-0.498	G
72.333	-0.581	G



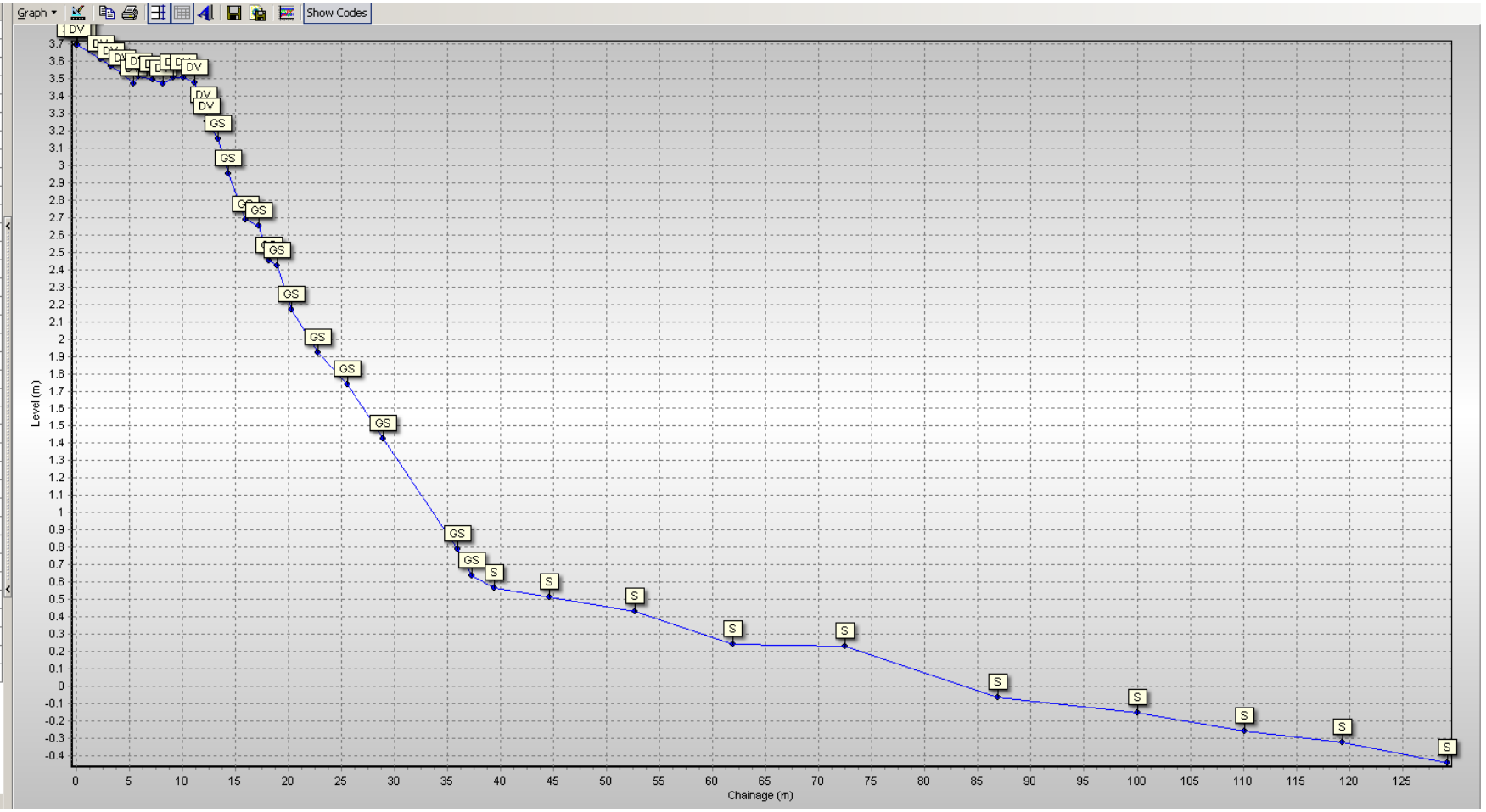
1aBTBC25 - 12/10/2010

Chainage	Level	Code
0.000	4.271	
0.077	4.271	ZZ
1.333	4.239	ZZ
2.109	4.125	GR
2.807	4.024	GR
3.496	3.766	GR
3.723	3.764	GR
3.881	3.685	ZZ
5.433	3.611	ZZ
7.134	3.584	ZZ
7.201	3.622	GR
8.524	3.742	GR
9.769	3.817	GR
11.118	3.863	GR
12.176	3.917	GR
12.919	3.885	GR
14.152	3.863	GR
14.695	3.769	GR
15.513	3.976	GR
16.081	3.978	GR
16.502	3.941	GR
17.053	3.933	GR
17.166	3.477	B
17.948	3.454	B
18.389	3.258	B
19.601	2.693	B
21.199	2.289	B
23.162	1.991	B
25.780	1.563	B
28.273	1.244	B
31.020	0.960	B
32.879	0.752	B
35.798	0.459	GS
38.781	0.204	GS
43.164	0.013	GS
45.890	0.007	S
53.122	-0.079	S
62.569	-0.223	S
72.548	-0.360	S
84.496	-0.493	S
95.633	-0.583	S
103.847	-0.657	S



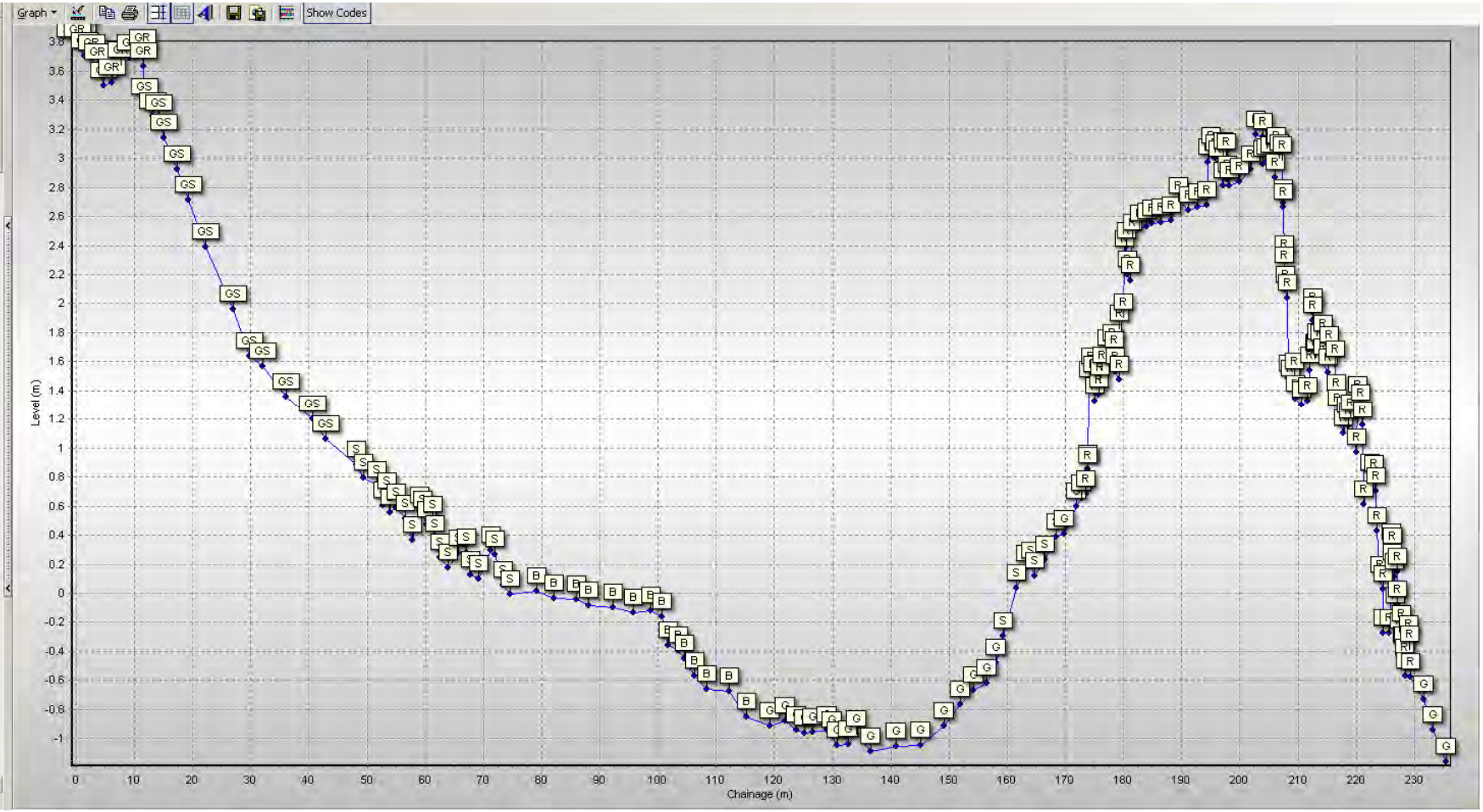
1aBTBC26 - 12/10/2010

Chainage	Level	Code
0.000	3.696	
0.065	3.696	DV
2.262	3.611	DV
3.293	3.571	DV
4.357	3.531	DV
5.337	3.475	DV
5.880	3.511	DV
7.198	3.497	DV
8.178	3.473	DV
9.152	3.509	DV
10.115	3.507	DV
11.128	3.480	DV
12.020	3.319	DV
12.286	3.252	DV
13.352	3.157	GS
14.325	2.955	GS
15.987	2.691	GS
17.244	2.653	GS
18.194	2.454	GS
18.890	2.427	GS
20.273	2.170	GS
22.741	1.923	GS
25.572	1.741	GS
28.886	1.428	GS
35.942	0.789	GS
37.326	0.636	GS
39.442	0.566	S
44.606	0.516	S
52.649	0.429	S
61.860	0.245	S
72.470	0.231	S
86.885	-0.060	S
100.061	-0.150	S
110.127	-0.254	S
119.412	-0.320	S
129.264	-0.439	S



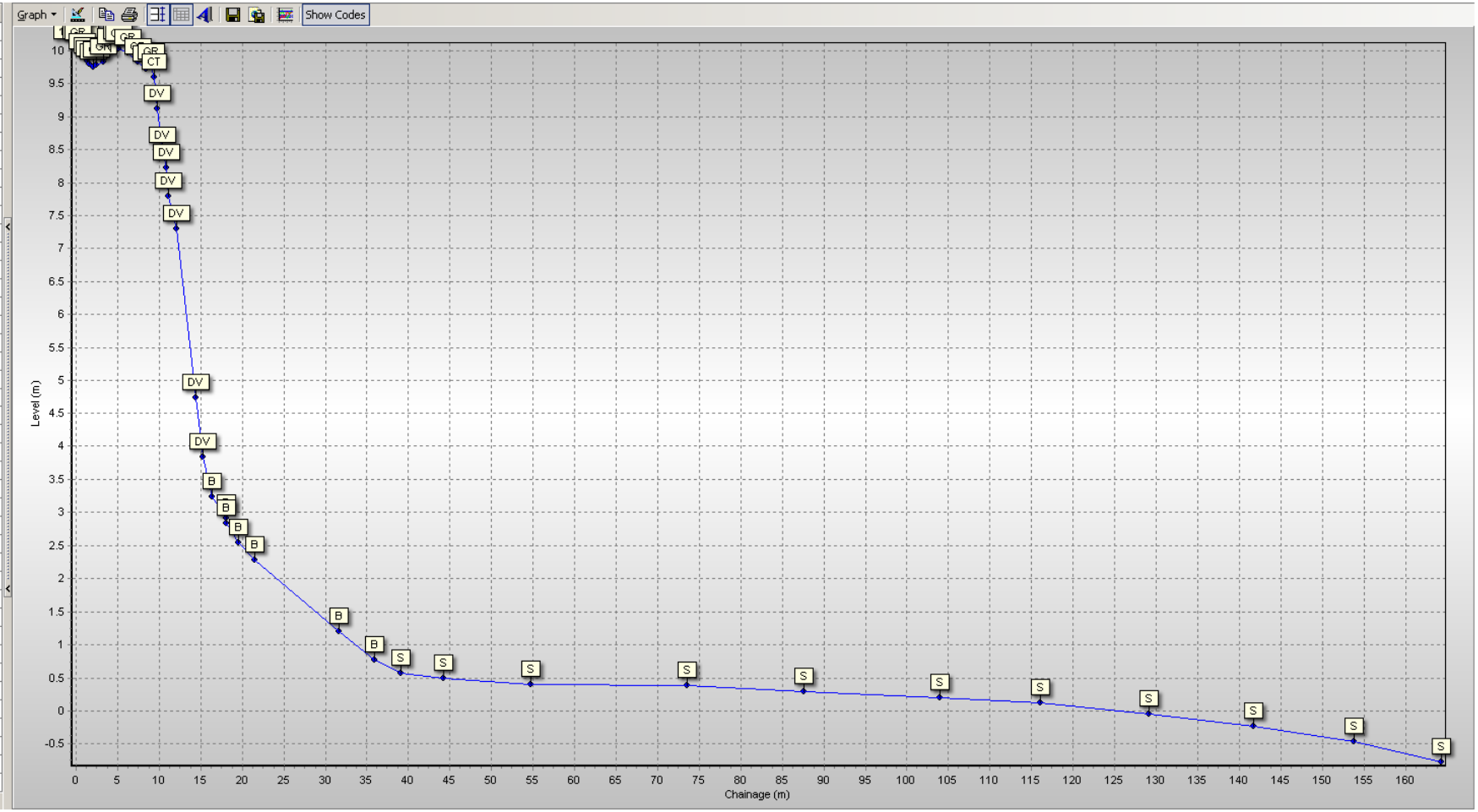
1aBTBC27 - 12/10/2010

Chainage	Level	Code
0.000	3.782	
0.197	3.782	GR
1.319	3.708	GR
2.689	3.691	GR
3.709	3.624	GR
4.782	3.502	GR
6.142	3.524	GR
7.721	3.643	GR
9.338	3.689	GR
11.371	3.724	GR
11.625	3.637	GR
11.743	3.389	GS
13.103	3.290	GS
14.254	3.278	GS
15.015	3.143	GS
17.296	2.922	GS
19.278	2.712	GS
22.296	2.393	GS
26.975	1.959	GS
29.717	1.636	GS
32.084	1.565	GS
36.034	1.360	GS
40.556	1.203	GS
42.958	1.058	GS
48.134	0.885	S
49.289	0.793	S
51.616	0.748	S
52.686	0.605	S
53.430	0.667	S
54.003	0.555	S
55.042	0.590	S
56.624	0.510	S
57.814	0.363	S
58.942	0.568	S
59.605	0.544	S
60.175	0.468	S
61.252	0.503	S
61.664	0.373	S
62.547	0.245	S
63.883	0.178	S
65.688	0.272	S
66.964	0.281	S



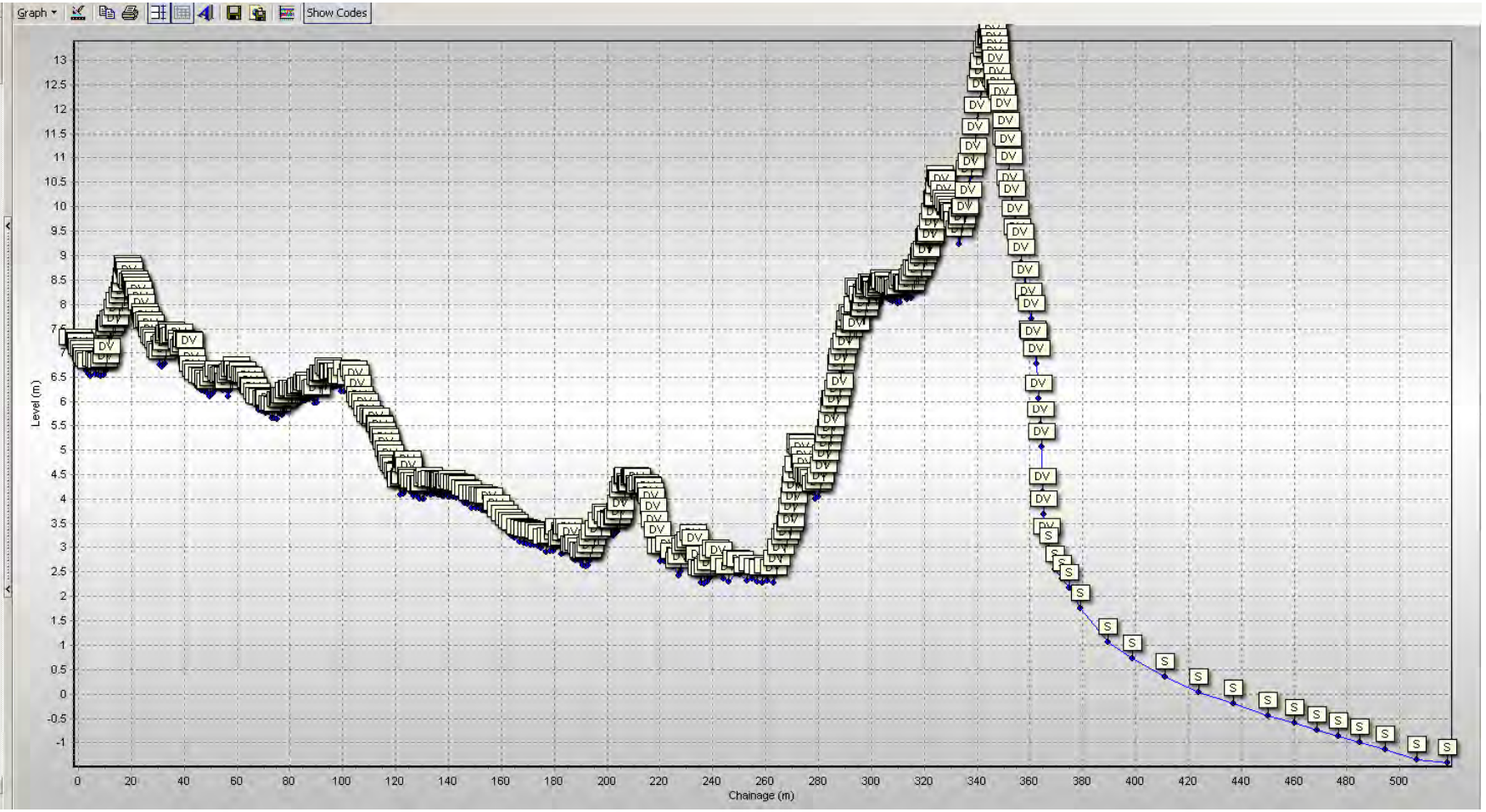
1aBTBC28 - 12/10/2010

Chainage	Level	Code
0.000	10.057	
0.047	10.057	GR
0.202	10.040	GR
0.758	9.908	GR
1.311	9.848	GR
1.558	9.795	GR
2.029	9.749	GR
2.407	9.778	GR
3.272	9.822	GR
4.148	9.977	GR
4.836	10.052	GR
5.189	10.028	GR
6.200	9.961	GR
7.445	9.830	GR
8.432	9.724	GR
9.095	9.743	GR
9.355	9.600	CT
9.755	9.121	DV
10.419	8.491	DV
10.889	8.226	DV
11.177	7.788	DV
12.048	7.303	DV
14.456	4.749	DV
15.326	3.839	DV
16.329	3.231	B
18.052	2.909	B
18.069	2.839	B
19.570	2.538	B
21.503	2.272	B
31.588	1.194	B
35.978	0.763	B
39.118	0.569	S
44.267	0.486	S
54.728	0.405	S
73.495	0.391	S
87.602	0.294	S
103.974	0.197	S
116.047	0.123	S
129.188	-0.039	S
141.758	-0.224	S
153.769	-0.455	S
164.327	-0.770	S



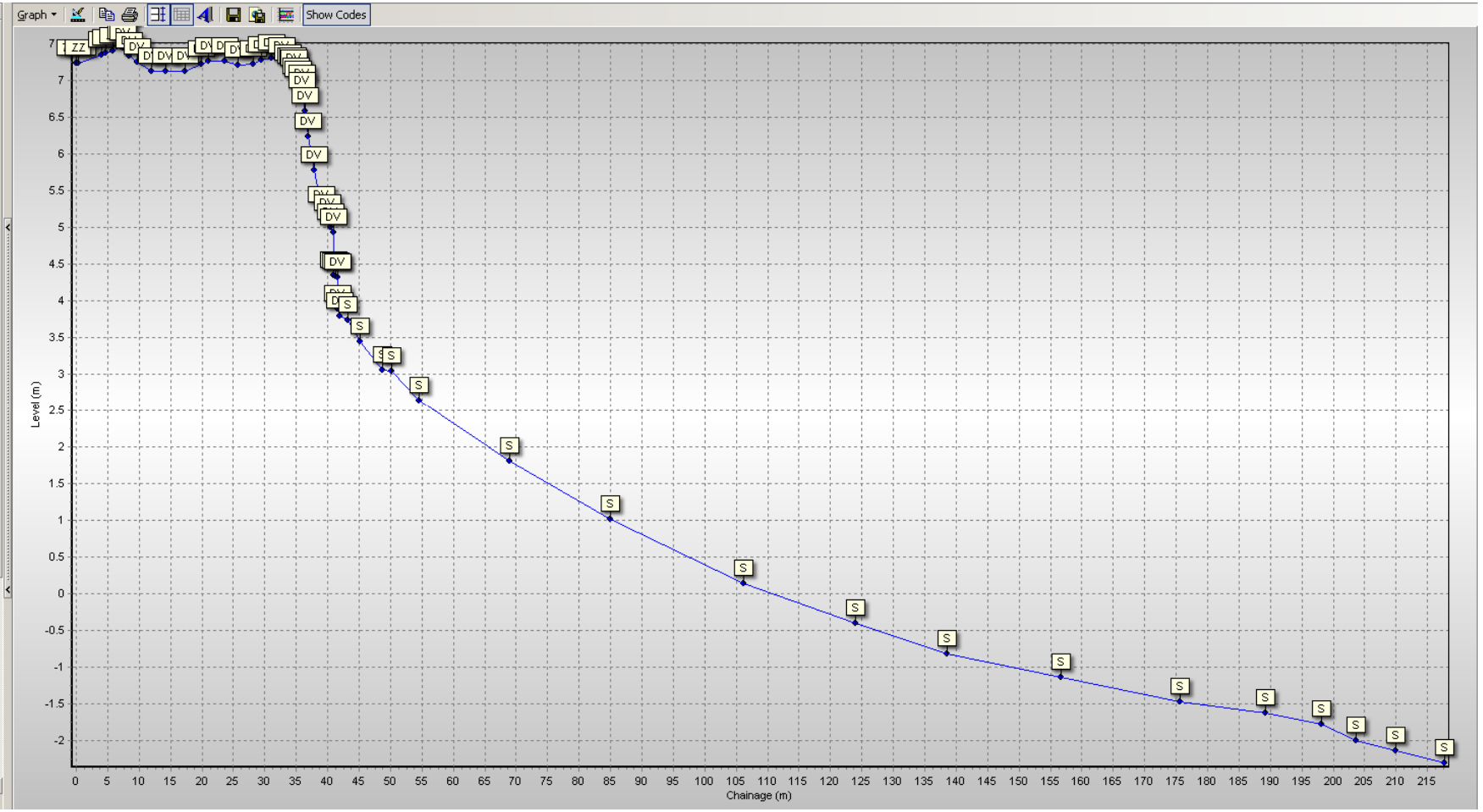
1aBTBC29 - 07/10/2010

Chainage	Level	Code
0.000	7.003	
0.038	7.003	DV
0.330	6.938	DV
0.875	6.914	DV
1.215	6.818	DV
1.927	6.787	DV
2.770	6.686	DV
3.162	6.632	DV
3.898	6.562	DV
4.704	6.519	DV
6.409	6.559	DV
7.533	6.542	DV
8.613	6.531	DV
9.745	6.548	DV
10.378	6.622	DV
10.927	6.810	DV
11.395	7.202	DV
11.866	7.296	DV
12.233	7.281	DV
12.939	7.381	DV
13.808	7.403	DV
14.547	7.613	DV
15.398	7.765	DV
16.429	7.865	DV
17.245	7.981	DV
17.632	8.102	DV
18.087	8.273	DV
18.467	8.510	DV
18.857	8.475	DV
19.153	8.396	DV
19.597	8.254	DV
20.600	8.166	DV
21.156	8.195	DV
21.546	8.133	DV
21.855	8.077	DV
22.191	7.999	DV
22.740	8.001	DV
23.468	7.845	DV
24.099	7.717	DV
25.097	7.537	DV
25.588	7.469	DV
26.025	7.349	DV



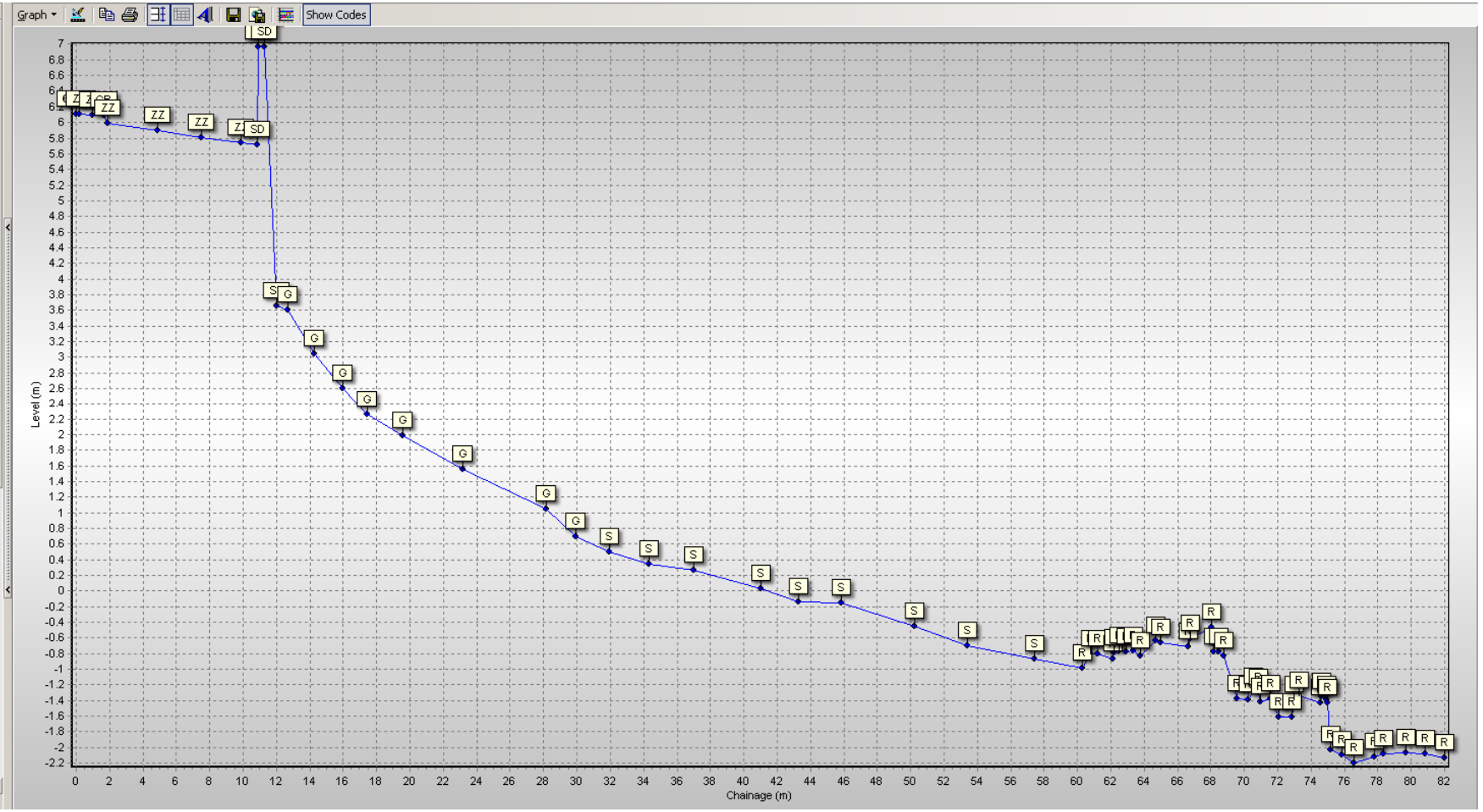
1aBTBC30 - 07/10/2010

Chainage	Level	Code
0.000	7.231	
0.257	7.231	ZZ
4.069	7.337	ZZ
4.729	7.372	ZZ
5.869	7.393	ZZ
7.046	7.454	DV
7.490	7.444	DV
8.462	7.331	DV
9.737	7.251	DV
11.982	7.123	DV
14.276	7.117	DV
17.373	7.127	DV
19.891	7.217	DV
21.113	7.265	DV
23.577	7.264	DV
25.678	7.201	DV
28.129	7.220	DV
29.397	7.270	DV
31.036	7.298	DV
32.657	7.255	DV
33.747	7.159	DV
34.110	7.121	DV
34.531	7.122	DV
34.676	7.088	DV
34.981	6.976	DV
35.307	6.944	DV
35.874	6.888	DV
35.984	6.787	DV
36.450	6.583	DV
36.914	6.238	DV
37.926	5.771	DV
39.068	5.237	DV
39.917	5.116	DV
40.509	4.997	DV
40.969	4.921	DV
41.000	4.336	DV
41.353	4.329	DV
41.587	4.317	DV
41.611	3.891	DV
41.910	3.787	DV
43.153	3.727	S
45.107	3.446	S



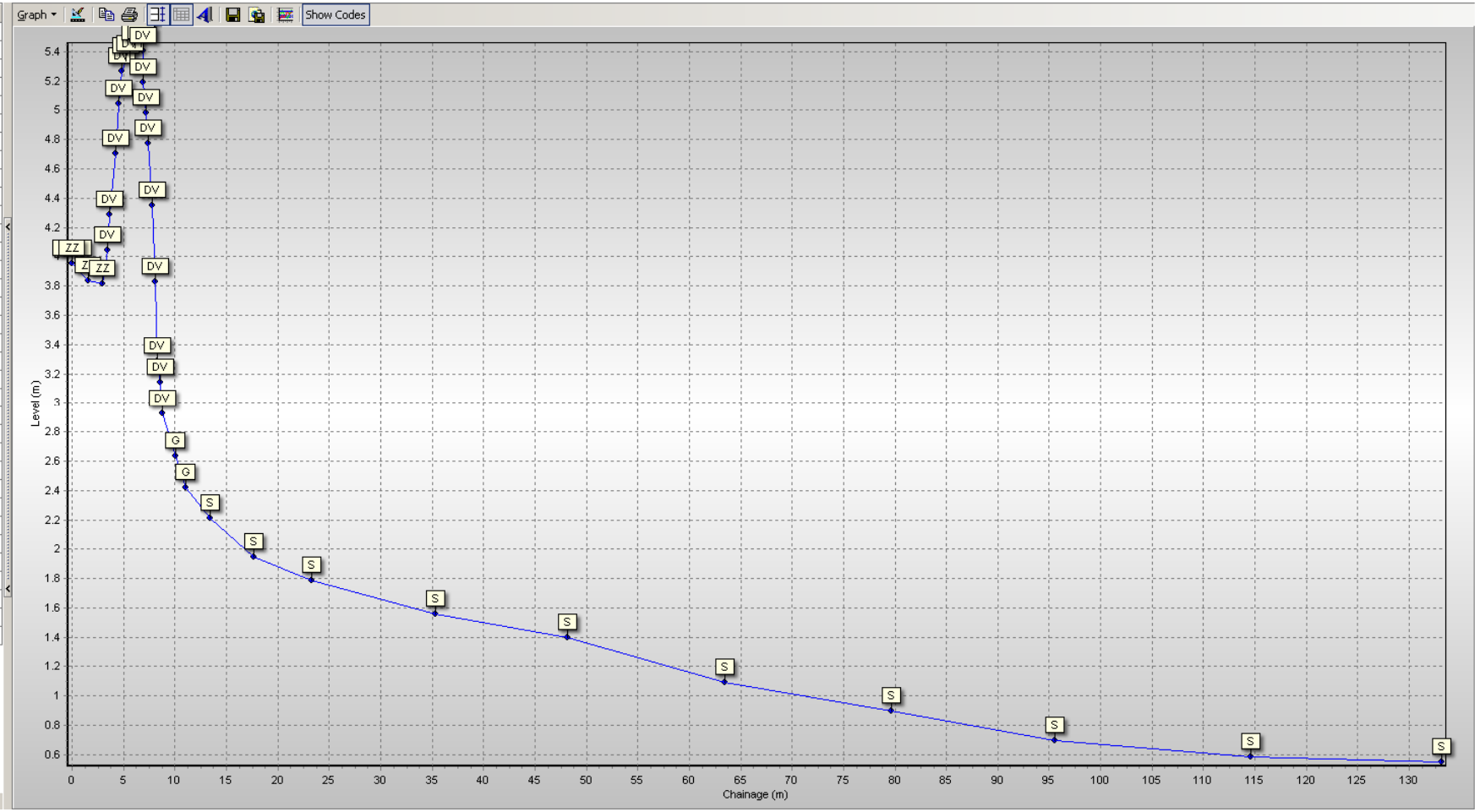
1aBTBC31 - 07/10/2010

Chainage	Level	Code
0.000	6.111	
0.201	6.111	ZZ
0.967	6.087	ZZ
1.633	6.088	GR
1.865	5.990	ZZ
4.848	5.900	ZZ
7.521	5.811	ZZ
9.893	5.737	ZZ
10.836	5.719	SD
10.901	6.967	SD
11.275	6.965	SD
12.026	3.656	SD
12.684	3.607	G
14.285	3.036	G
15.984	2.596	G
17.413	2.256	G
19.544	1.984	G
23.138	1.560	G
28.195	1.043	G
29.949	0.702	G
31.973	0.505	S
34.334	0.343	S
37.016	0.260	S
41.026	0.034	S
43.309	-0.137	S
45.816	-0.155	S
50.259	-0.451	S
53.427	-0.695	S
57.431	-0.872	S
60.270	-0.987	R
60.757	-0.810	R
61.201	-0.798	R
62.141	-0.875	R
62.198	-0.797	R
62.486	-0.761	R
62.886	-0.779	R
63.341	-0.763	R
63.795	-0.827	R
64.670	-0.636	R
65.001	-0.658	R
66.634	-0.708	R
66.768	-0.602	R



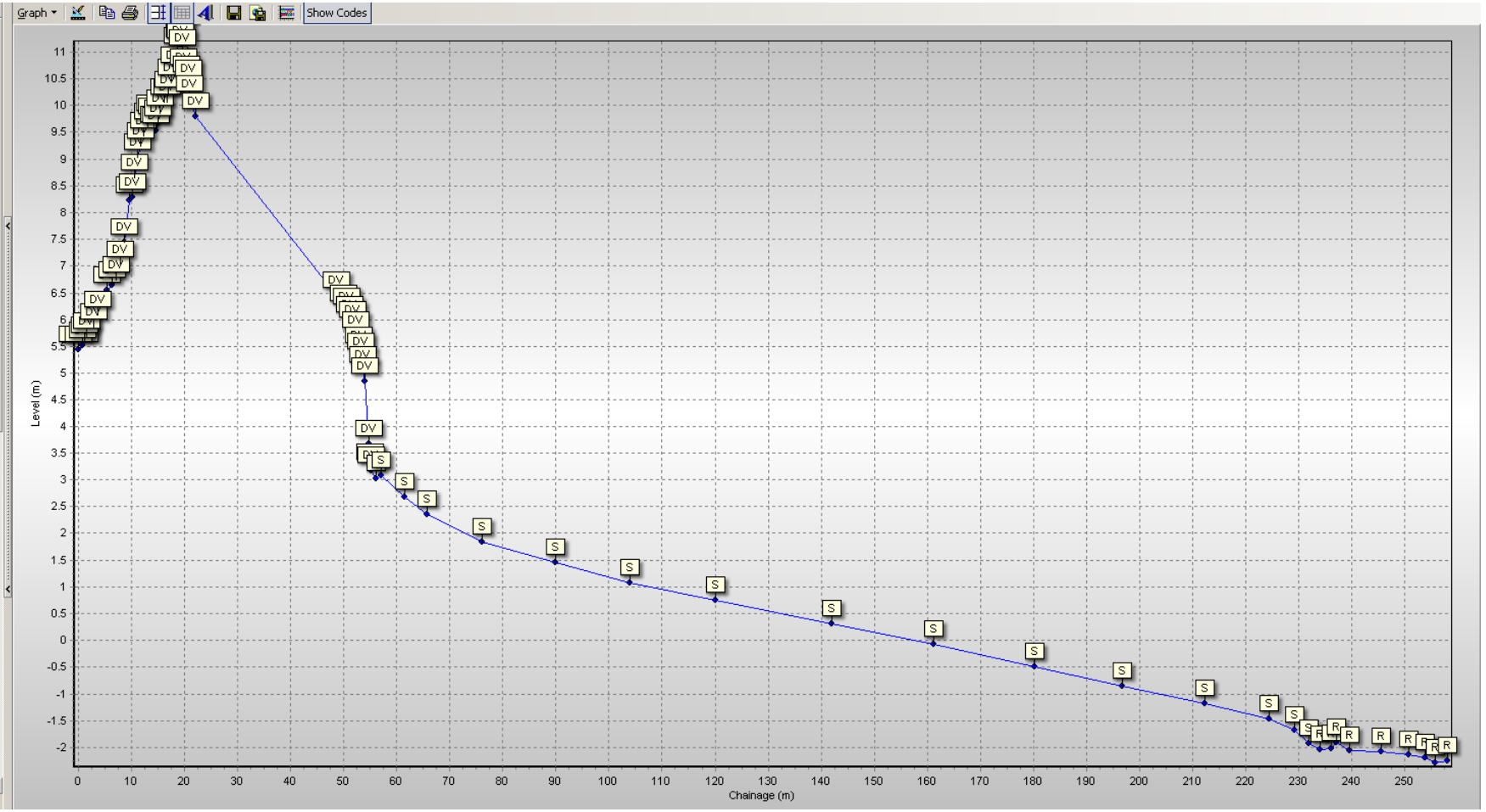
1aBTBC32 - 07/10/2010

Chainage	Level	Code
0.000	3.956	
0.028	3.956	ZZ
1.574	3.835	ZZ
2.985	3.818	ZZ
3.487	4.042	DV
3.699	4.289	DV
4.236	4.702	DV
4.586	5.042	DV
4.846	5.270	DV
5.276	5.335	DV
5.646	5.349	DV
6.142	5.428	DV
6.687	5.434	DV
6.896	5.406	DV
6.918	5.191	DV
7.203	4.984	DV
7.393	4.771	DV
7.806	4.351	DV
8.120	3.832	DV
8.248	3.284	DV
8.548	3.140	DV
8.762	2.925	DV
10.025	2.634	G
11.046	2.419	G
13.431	2.213	S
17.673	1.949	S
23.252	1.784	S
35.323	1.557	S
48.199	1.398	S
63.513	1.093	S
79.607	0.896	S
95.527	0.698	S
114.620	0.584	S
133.150	0.550	S



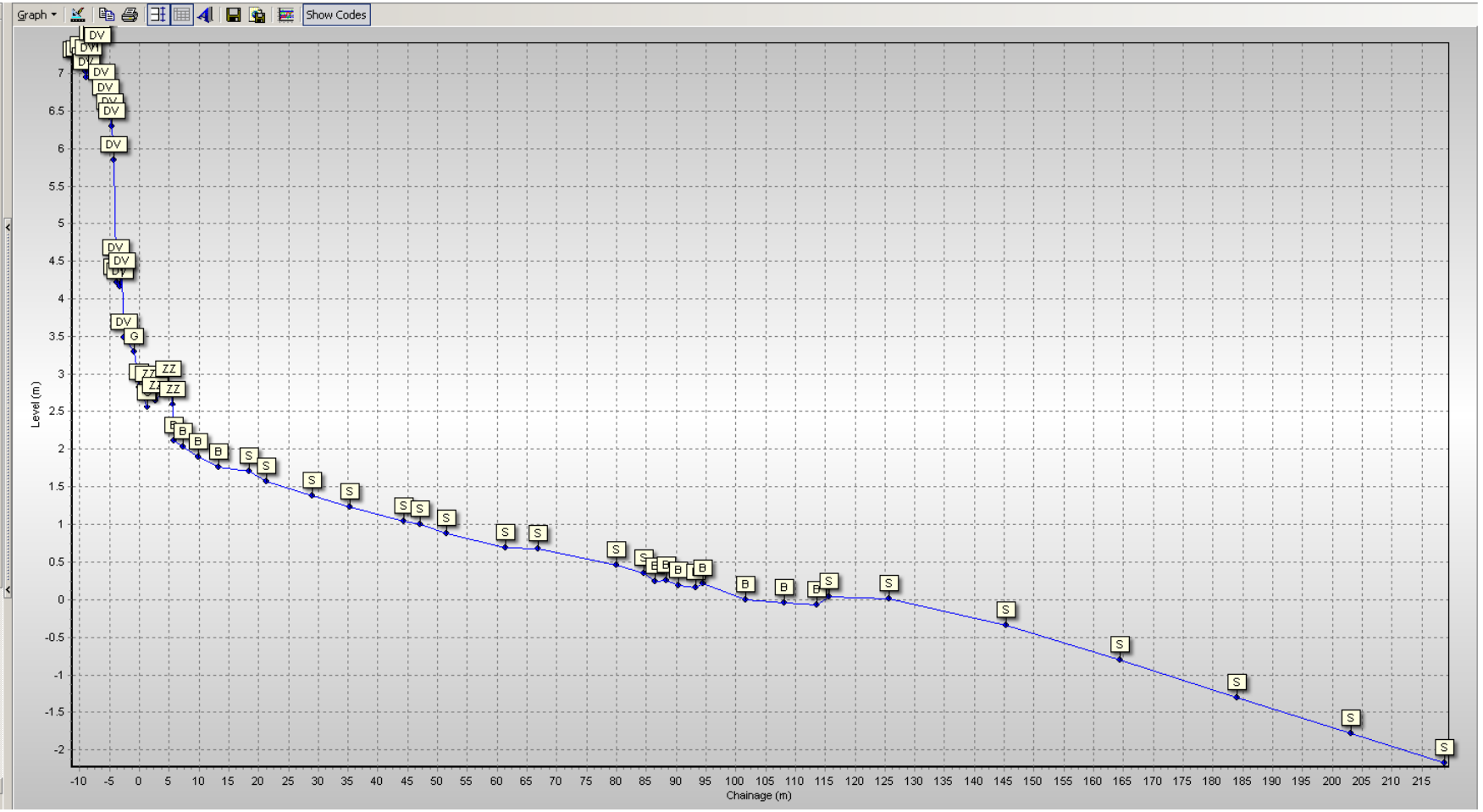
1aBTBC33 - 07/10/2010

Chainage	Level	Code
0.000	5.447	
0.009	5.447	DV
0.740	5.523	DV
1.138	5.619	DV
1.581	5.700	DV
2.899	5.857	DV
3.699	6.096	DV
5.421	6.553	DV
6.265	6.638	DV
7.121	6.738	DV
7.886	7.018	DV
8.552	7.446	DV
9.644	8.237	DV
10.261	8.288	DV
10.546	8.641	DV
11.154	9.028	DV
11.754	9.248	DV
12.362	9.440	DV
13.130	9.603	DV
13.359	9.762	DV
13.822	9.708	DV
14.280	9.550	DV
14.579	9.533	DV
14.894	9.661	DV
15.417	9.842	DV
16.072	10.060	DV
16.702	10.064	DV
16.928	10.204	DV
17.412	10.425	DV
18.051	10.653	DV
18.644	11.016	DV
18.947	11.130	DV
19.262	11.116	DV
19.539	10.976	DV
19.865	10.606	DV
20.390	10.480	DV
20.745	10.400	DV
21.006	10.120	DV
22.186	9.803	DV
48.549	6.449	DV
49.978	6.208	DV
50.601	6.144	DV



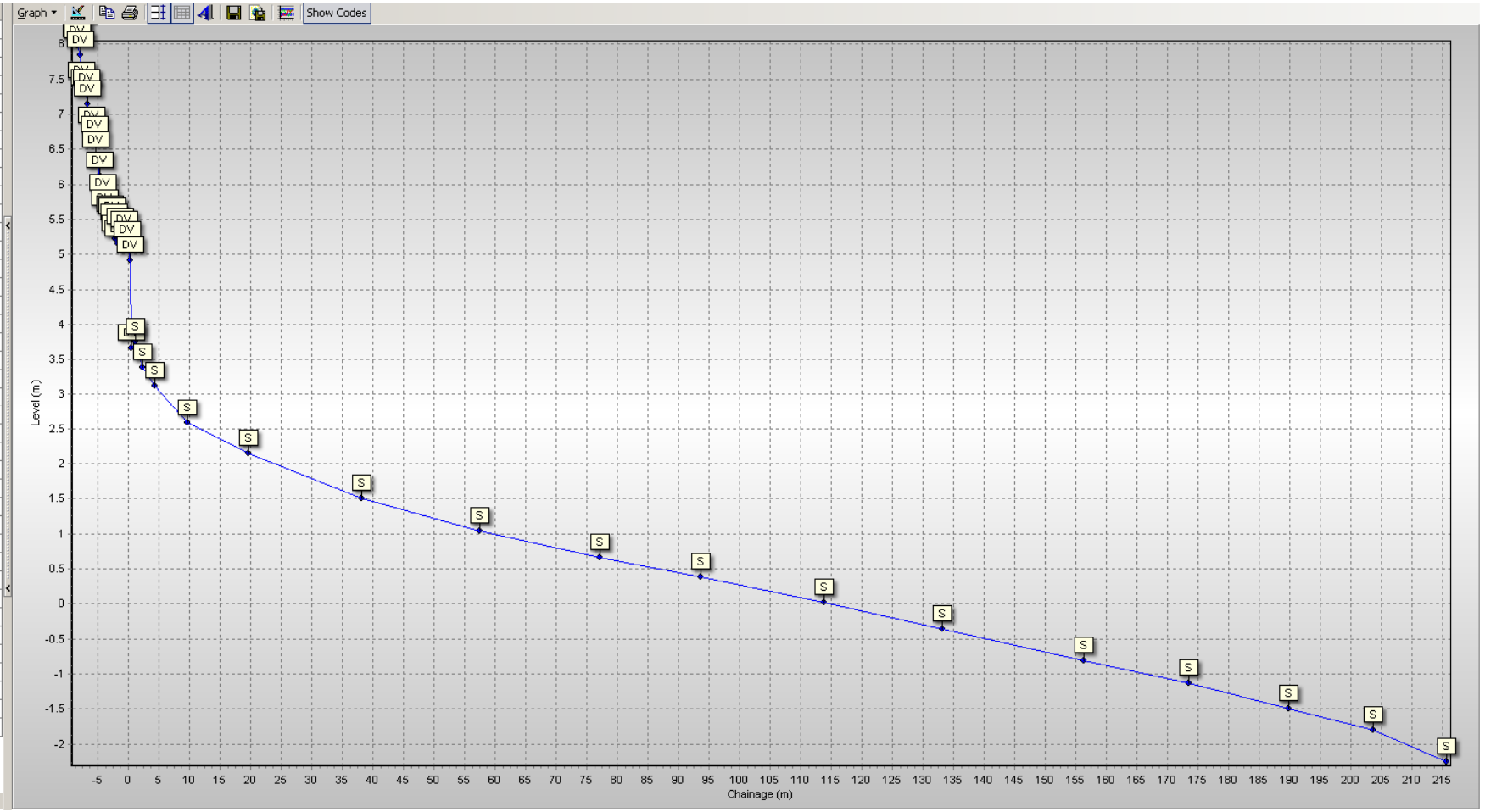
1aBTBC34 - 07/10/2010

Chainage	Level	Code
-10.566	7.112	DV
-9.984	7.124	DV
-9.336	7.170	DV
-9.070	7.021	DV
-8.838	6.940	DV
-8.585	7.136	DV
-7.865	7.333	DV
-7.162	7.349	DV
-6.916	7.299	DV
-6.229	6.814	DV
-5.648	6.608	DV
-5.022	6.408	DV
-4.600	6.295	DV
-4.202	5.852	DV
-3.974	4.482	DV
-3.682	4.225	DV
-3.242	4.168	DV
-2.909	4.305	DV
-2.545	3.492	DV
-0.922	3.300	G
0.077	2.826	G
1.326	2.550	G
1.539	2.793	ZZ
2.661	2.646	ZZ
4.978	2.869	ZZ
5.566	2.596	ZZ
5.819	2.103	B
7.348	2.030	B
9.887	1.891	B
13.391	1.760	B
18.363	1.699	S
21.247	1.571	S
28.976	1.373	S
35.242	1.228	S
44.435	1.038	S
47.161	1.001	S
51.525	0.872	S
61.477	0.692	S
66.950	0.679	S
80.005	0.456	S
84.588	0.348	S
86.554	0.242	B



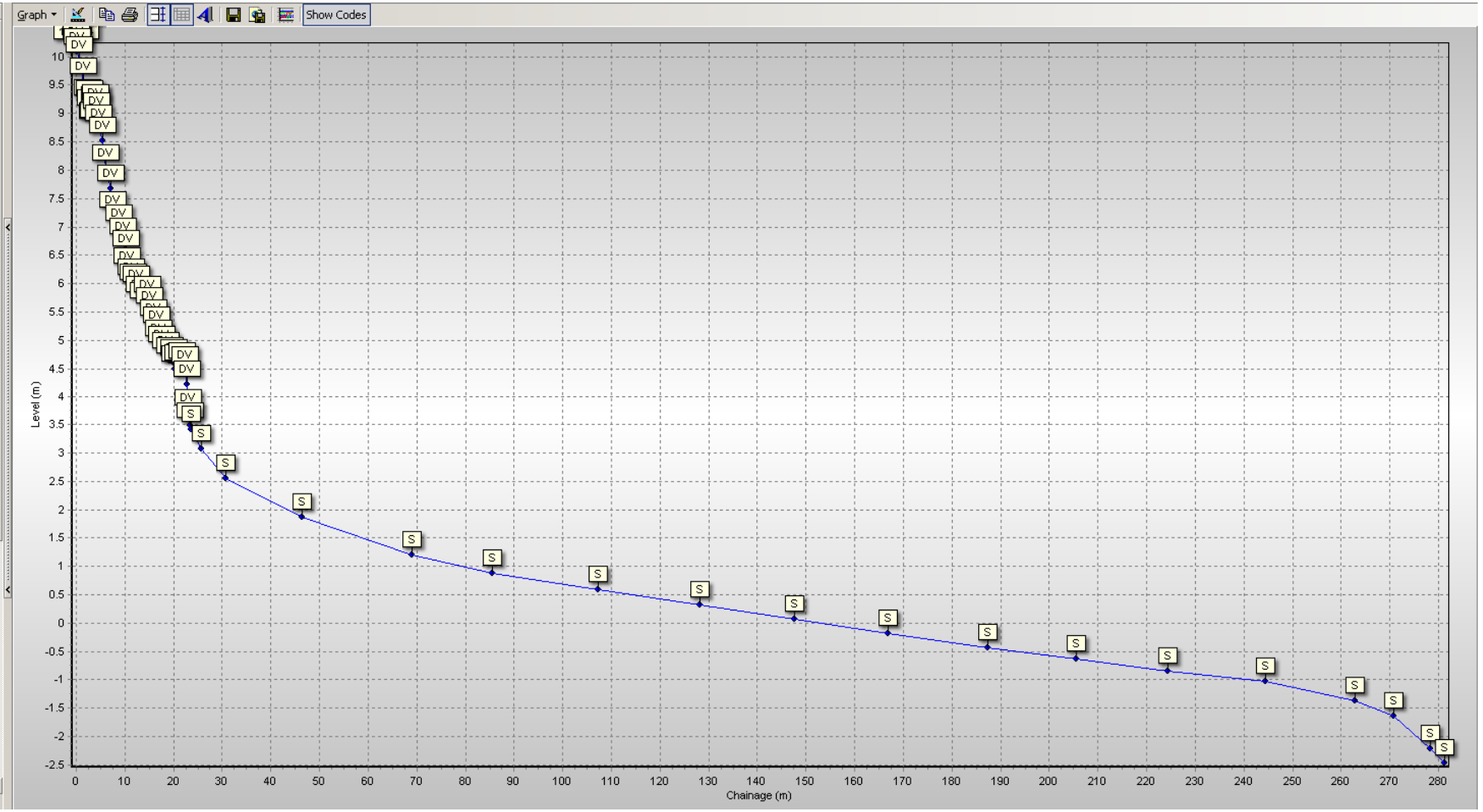
1aBTBC35 - 07/10/2010

Chainage	Level	Code
-8.460	7.991	DV
-8.354	7.974	DV
-7.865	7.849	DV
-7.639	7.412	DV
-7.162	7.309	DV
-6.770	7.301	DV
-6.602	7.151	DV
-5.916	6.765	DV
-5.531	6.629	DV
-5.215	6.412	DV
-4.652	6.132	DV
-4.115	5.811	DV
-3.733	5.593	DV
-2.880	5.500	DV
-2.579	5.463	DV
-2.333	5.379	DV
-2.144	5.220	DV
-1.699	5.145	DV
-1.234	5.317	DV
-0.698	5.275	DV
-0.087	5.139	DV
0.332	4.914	DV
0.560	3.665	DV
1.168	3.748	S
2.426	3.380	S
4.302	3.128	S
9.691	2.583	S
19.690	2.145	S
38.275	1.509	S
57.565	1.043	S
77.265	0.664	S
93.748	0.377	S
113.967	0.015	S
133.304	-0.355	S
156.331	-0.809	S
173.625	-1.131	S
189.839	-1.490	S
203.743	-1.806	S
215.732	-2.255	S



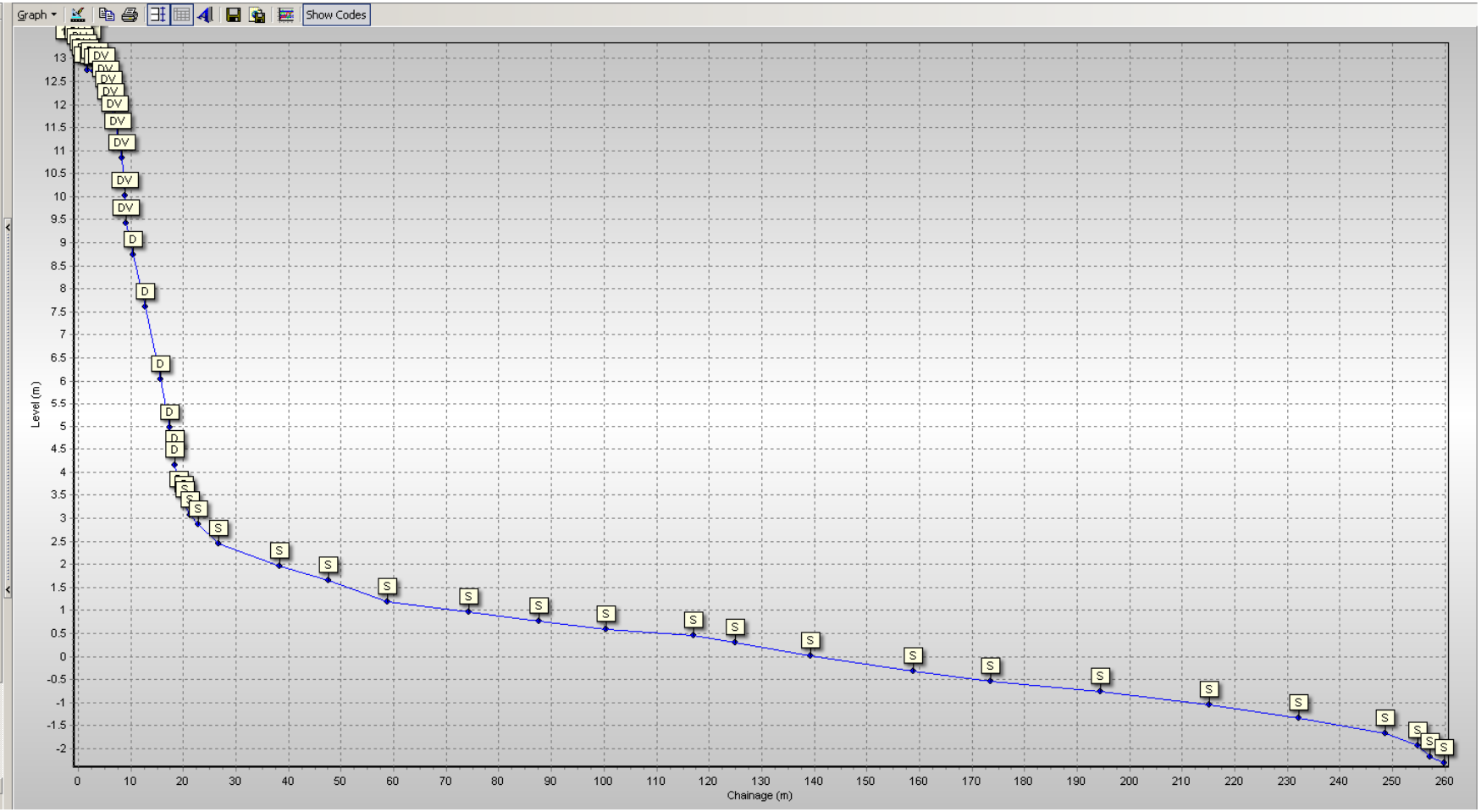
1aBTBC36 - 07/10/2010

Chainage	Level	Code
0.000	10.174	
0.087	10.174	DV
0.254	10.078	DV
0.717	9.938	DV
1.530	9.571	DV
2.386	9.192	DV
2.717	9.164	DV
2.955	9.007	DV
3.302	8.772	DV
3.513	8.785	DV
3.757	9.068	DV
3.954	9.091	DV
4.162	8.952	DV
4.524	8.736	DV
5.421	8.514	DV
6.097	8.035	DV
7.138	7.676	DV
7.450	7.215	DV
8.754	6.965	DV
9.679	6.736	DV
10.328	6.516	DV
10.496	6.210	DV
11.252	6.012	DV
11.770	5.932	DV
12.309	5.888	DV
13.058	5.717	DV
13.823	5.610	DV
14.579	5.710	DV
15.080	5.518	DV
15.918	5.294	DV
16.468	5.182	DV
17.000	4.941	DV
17.634	4.827	DV
18.385	4.731	DV
19.268	4.629	DV
19.990	4.600	DV
20.343	4.498	DV
20.960	4.503	DV
21.799	4.548	DV
22.407	4.469	DV
22.756	4.231	DV
22.934	3.723	DV



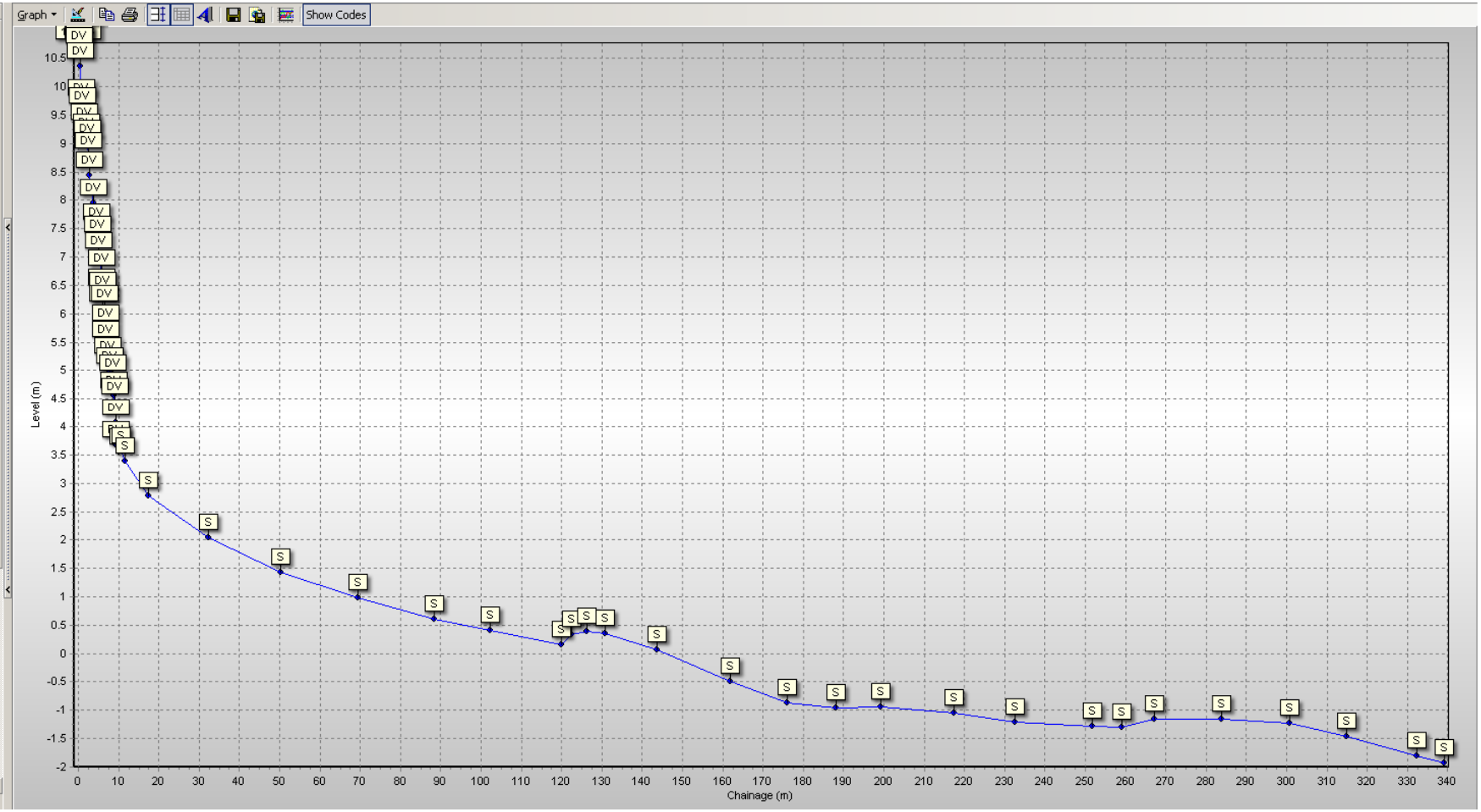
1aBTBC37 - 07/10/2010

Chainage	Level	Code
0.000	13.251	
0.064	13.251	DV
0.334	13.136	DV
0.981	13.016	DV
1.262	12.888	DV
1.831	12.744	DV
2.819	12.714	DV
3.055	12.820	DV
3.684	12.702	DV
4.418	12.713	DV
5.206	12.431	DV
5.853	12.208	DV
6.242	11.939	DV
6.880	11.688	DV
7.523	11.292	DV
8.280	10.829	DV
8.934	10.015	DV
9.141	9.414	DV
10.540	8.724	D
12.771	7.599	D
15.616	6.028	D
17.490	4.982	D
18.292	4.405	D
18.351	4.142	D
19.223	3.506	D
20.161	3.397	S
20.362	3.282	S
21.259	3.074	S
22.802	2.879	S
26.793	2.449	S
38.297	1.964	S
47.684	1.641	S
58.916	1.178	S
74.215	0.959	S
87.704	0.762	S
100.431	0.592	S
117.141	0.458	S
124.985	0.297	S
139.349	0.022	S
158.950	-0.315	S
173.471	-0.538	S
194.538	-0.769	S



1aBTBC38 - 07/10/2010

Chainage	Level	Code
0.000	10.703	
0.040	10.703	DV
0.149	10.675	DV
0.348	10.638	DV
0.609	10.358	DV
0.792	9.721	DV
1.016	9.572	DV
1.447	9.285	DV
1.997	9.103	DV
2.249	8.989	DV
2.470	8.783	DV
2.841	8.432	DV
3.691	7.961	DV
4.451	7.529	DV
4.727	7.300	DV
5.128	7.017	DV
5.761	6.713	DV
5.784	6.376	DV
6.083	6.313	DV
6.161	6.081	DV
6.629	6.093	DV
6.767	5.744	DV
6.924	5.448	DV
7.251	5.165	DV
7.916	4.995	DV
8.480	4.855	DV
8.767	4.549	DV
9.117	4.453	DV
9.315	4.078	DV
9.450	3.671	DV
10.051	3.554	S
10.569	3.577	S
11.729	3.394	S
17.510	2.778	S
32.282	2.036	S
50.357	1.426	S
69.487	0.979	S
88.414	0.598	S
102.222	0.411	S
119.858	0.147	S
122.382	0.330	S
126.235	0.382	S




Beach Profiles: 1aBTBC01
Profiles Envelope
01/04/2002
15/10/2007
21/10/2008
21/09/2009
23/09/2010
HAT
MHWS
MLWS
Level (m)
Chainage (m)
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
-1.6
-1.8
-2
0
2
4
6
8
10
12
14
16
18
20
22
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30
32
34
36
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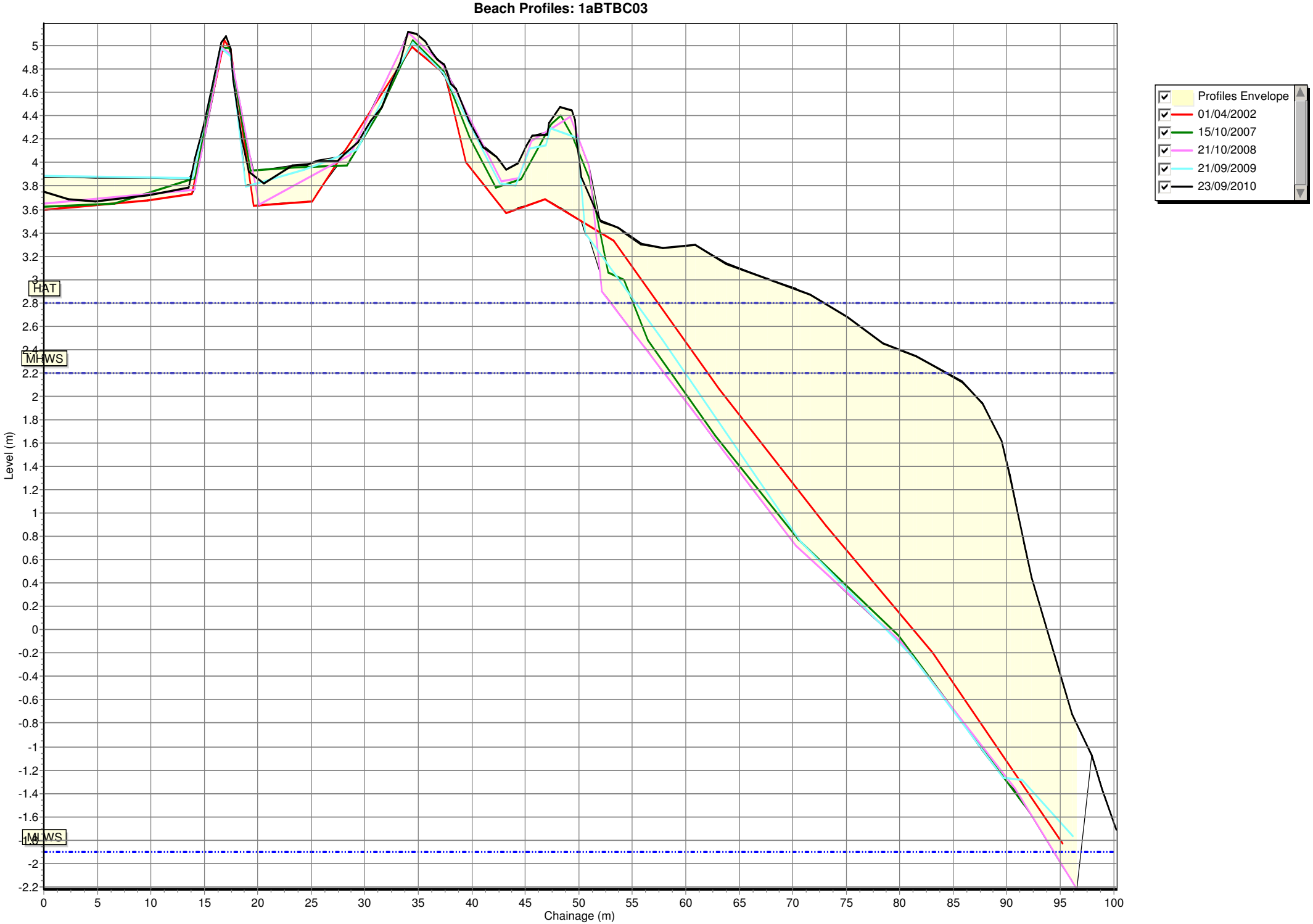
66
68
70
72

Beach Profiles: 1aBTBC02


Beach Profiles: 1aBTBC03
Profiles Envelope
01/04/2002
15/10/2007
21/10/2008
21/09/2009
23/09/2010
HAT
MHWS
MLWS
Level (m)
Chainage (m)
5
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
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-0.4
-0.6
-0.8
-1
-1.2
-1.4
-1.6
-1.8
-2
-2.2
0
5
10
15
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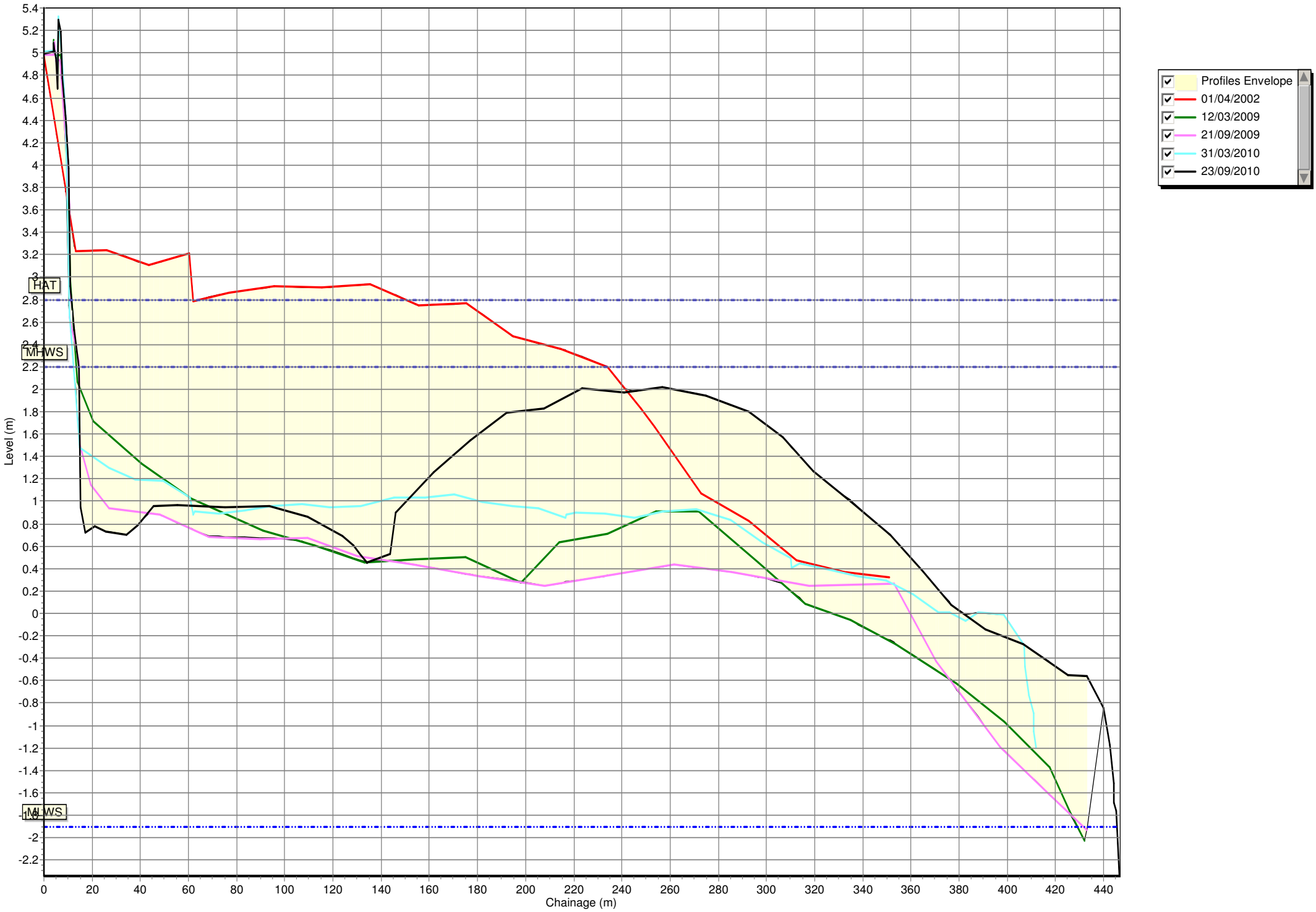
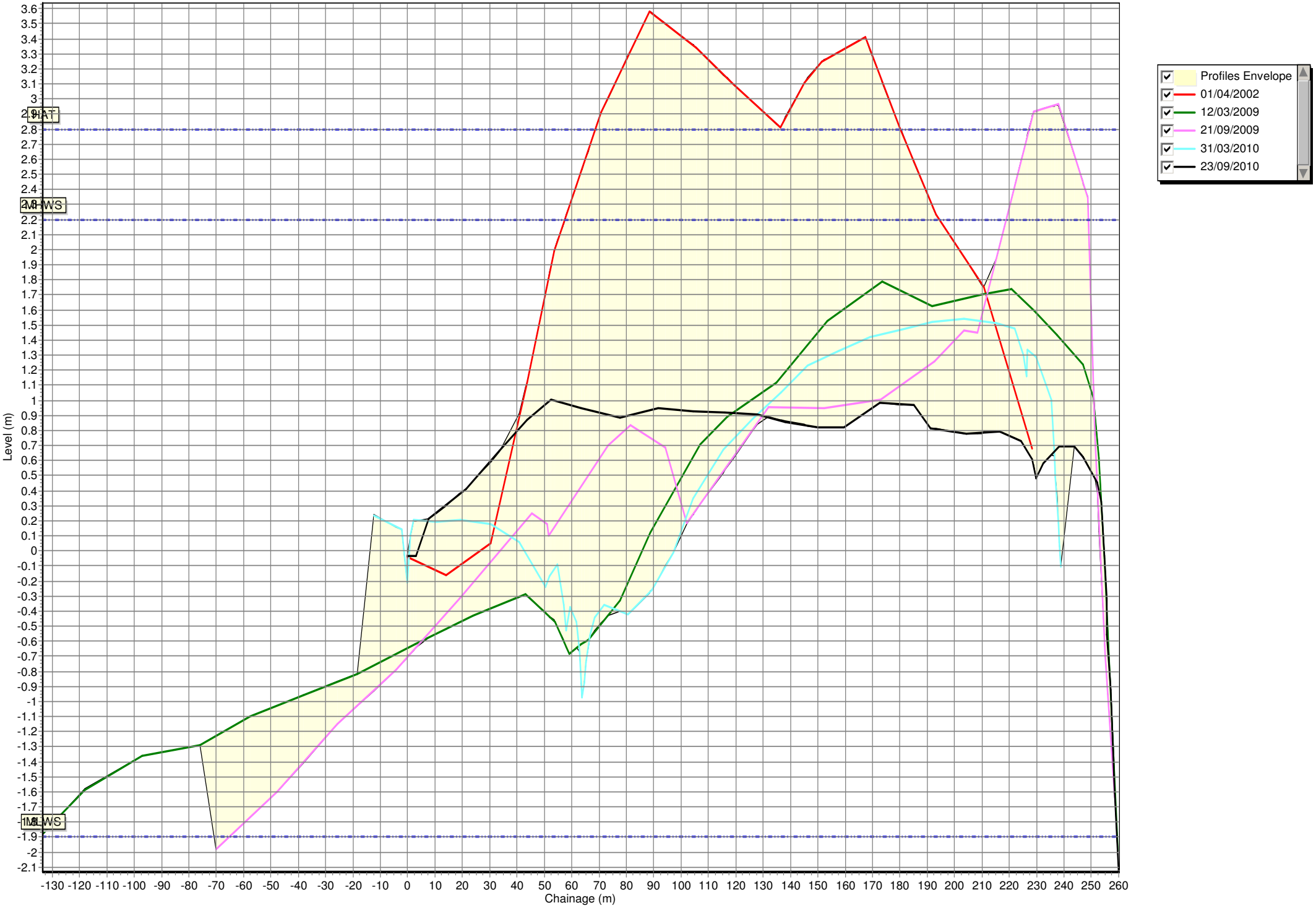
45
50
55
60
65
70
75
80
85
90
95
100

Beach Profiles: 1aBTBC04

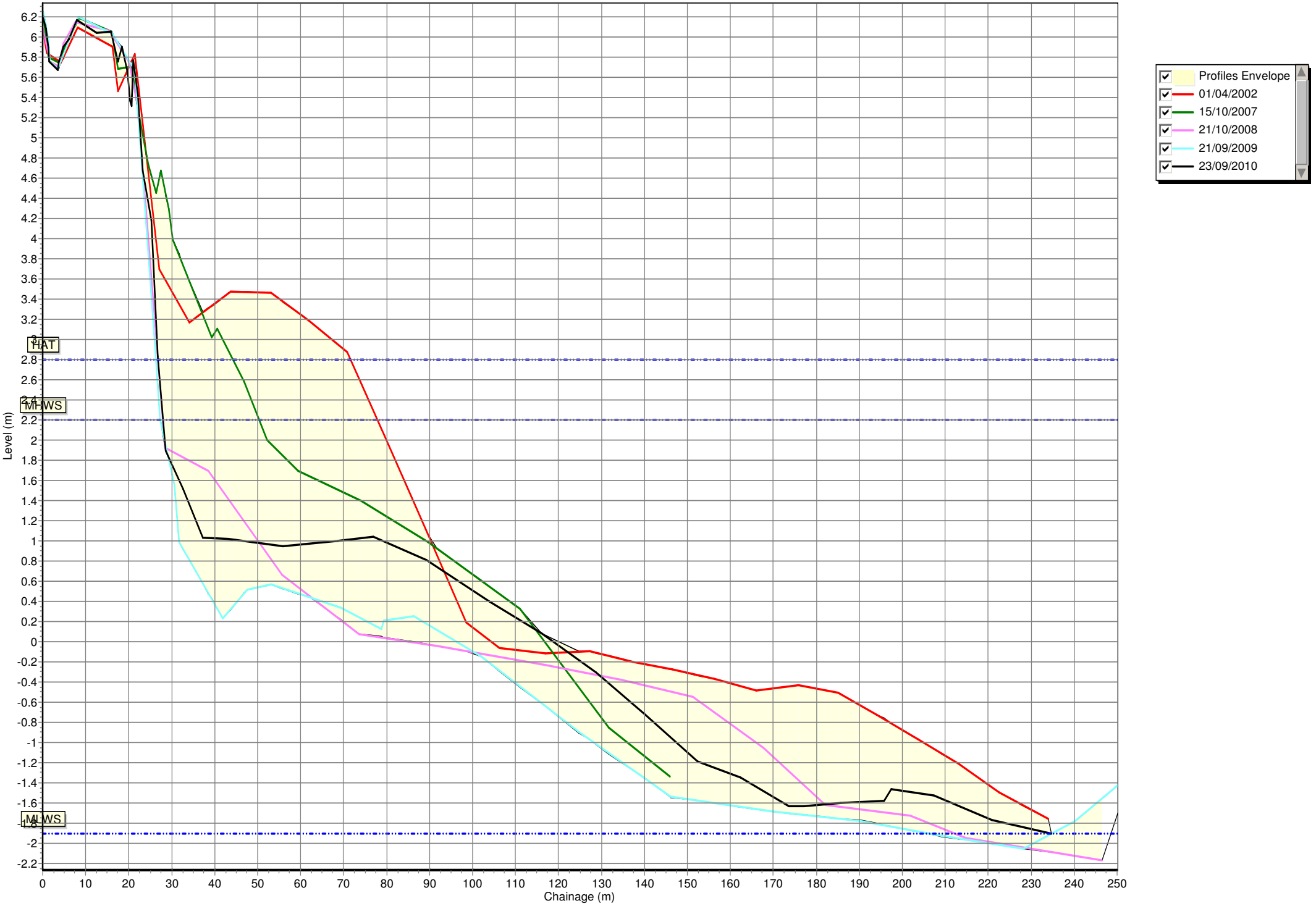


Beach Profiles: 1aBTBC05

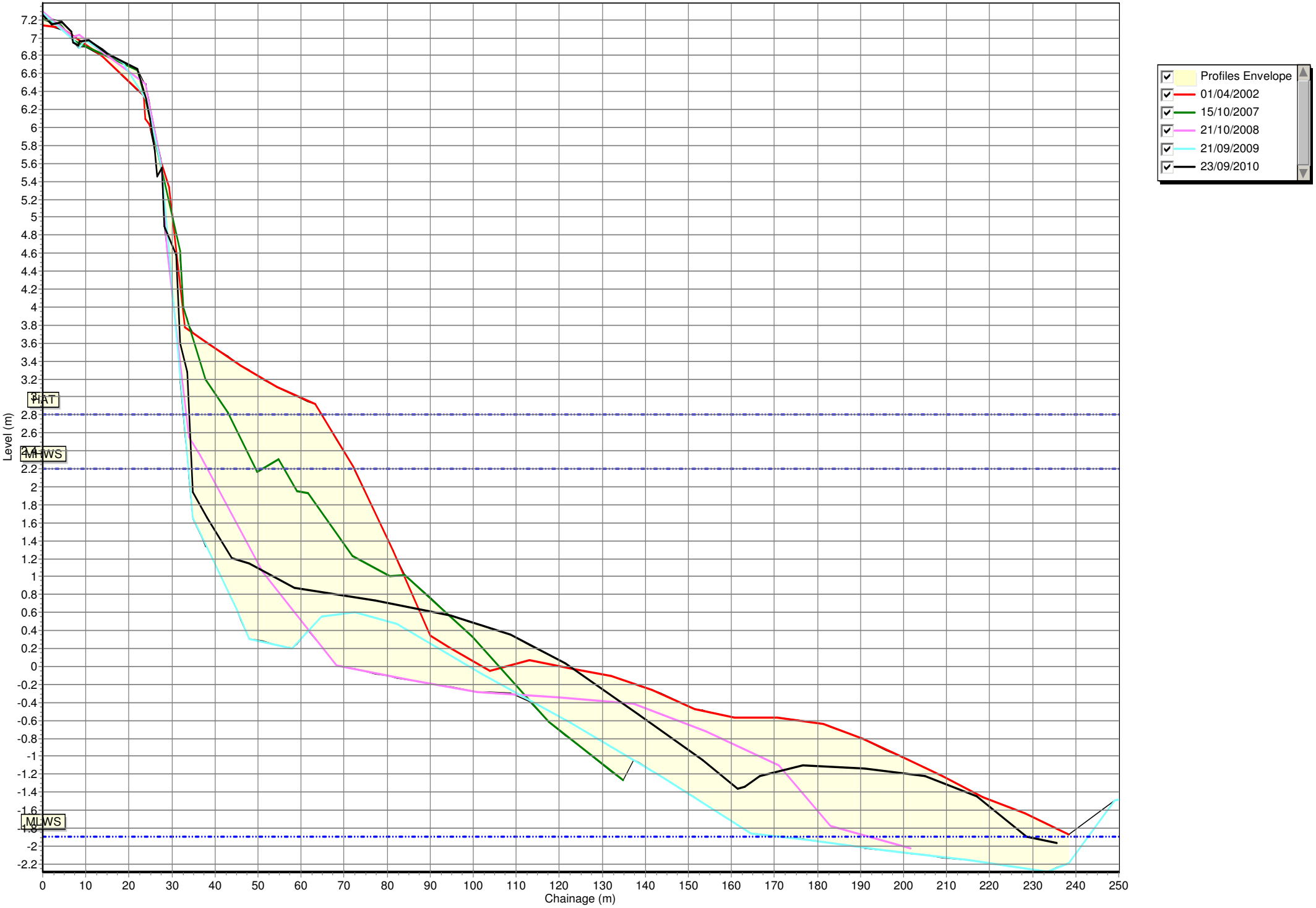


Beach Profiles: 1aBTBC06

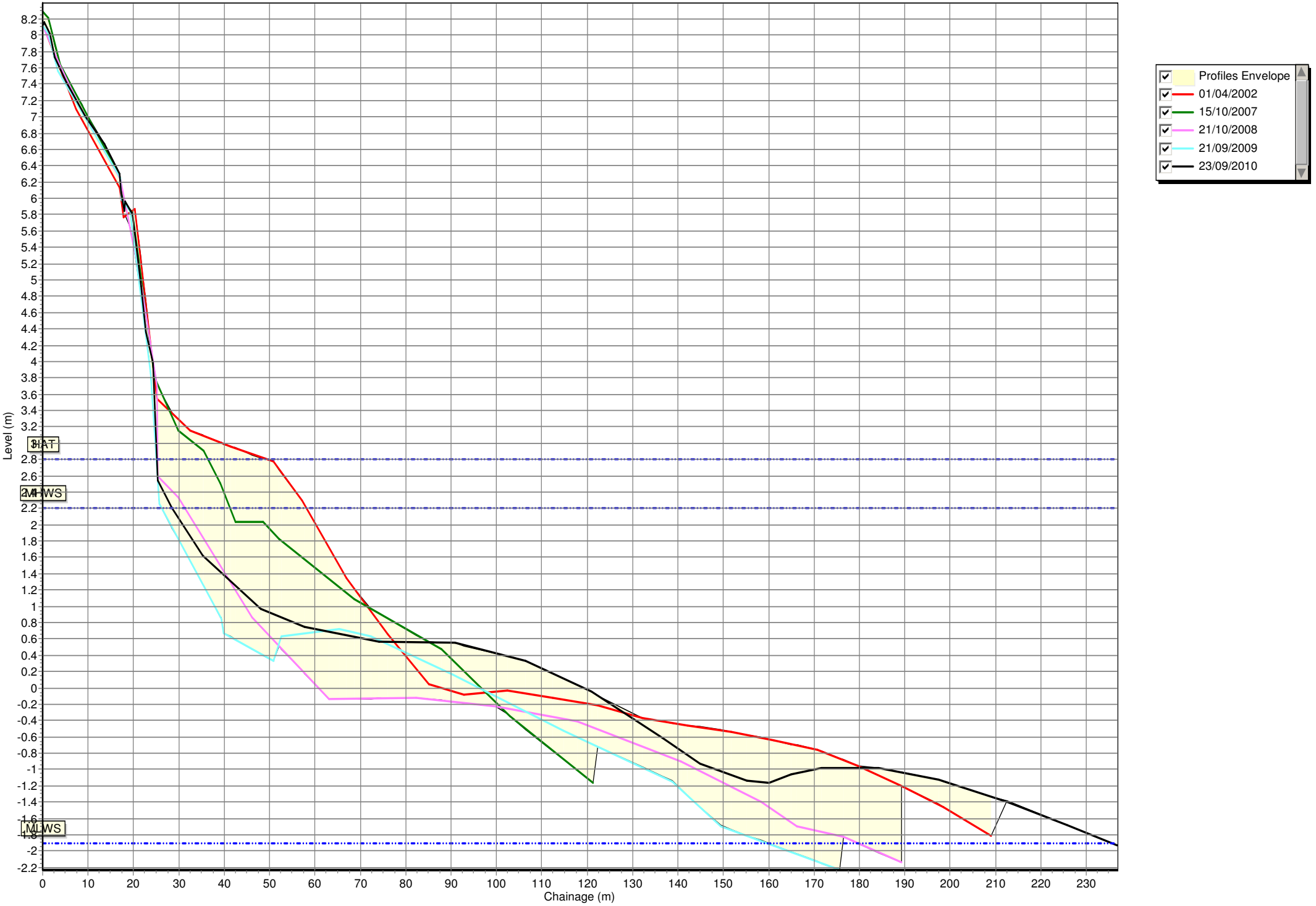
Beach Profiles: 1aBTBC07



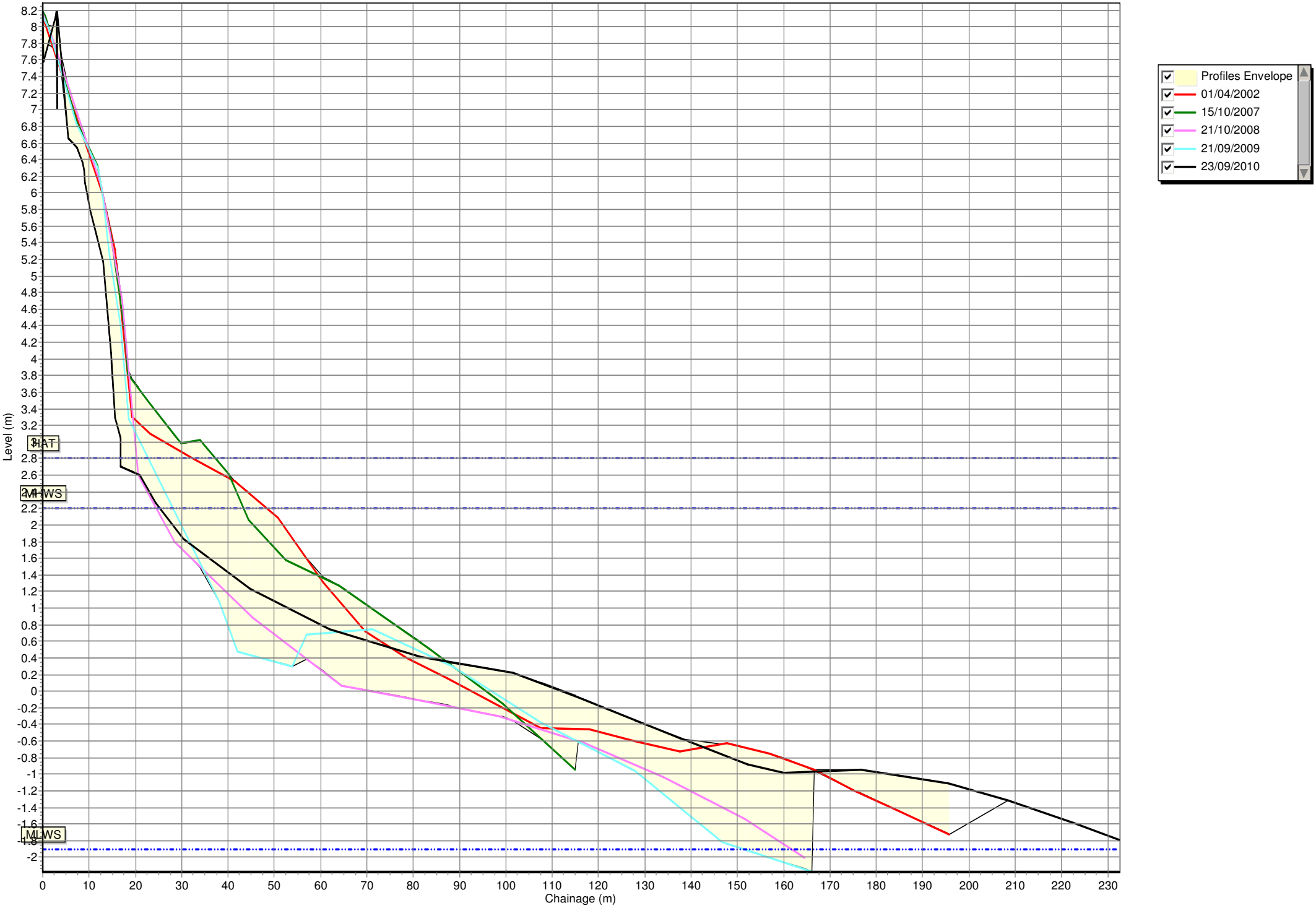
Beach Profiles: 1aBTBC08



Beach Profiles: 1aBTBC09

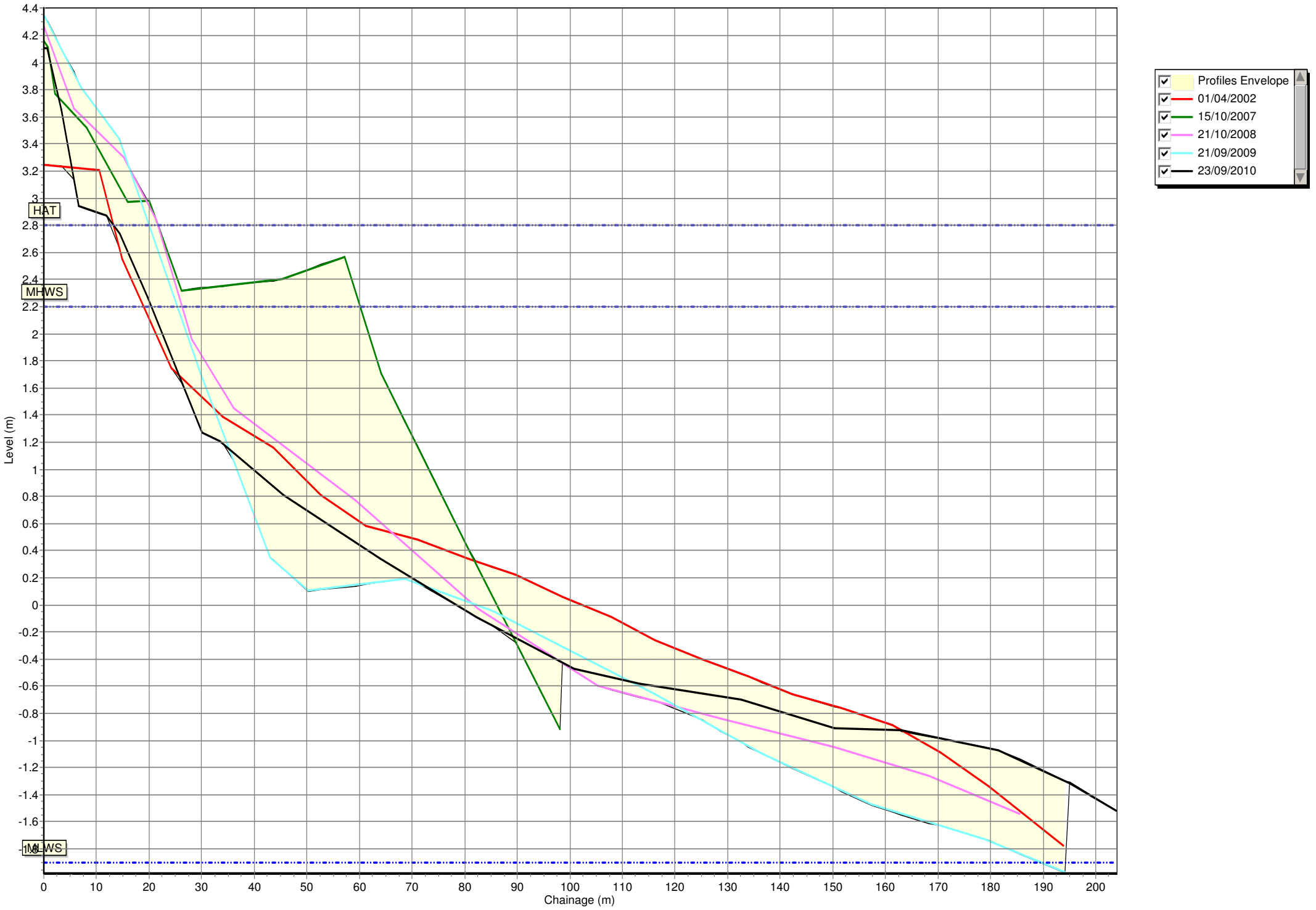


Beach Profiles: 1aBTBC10



Beach Profiles: 1aBTBC11

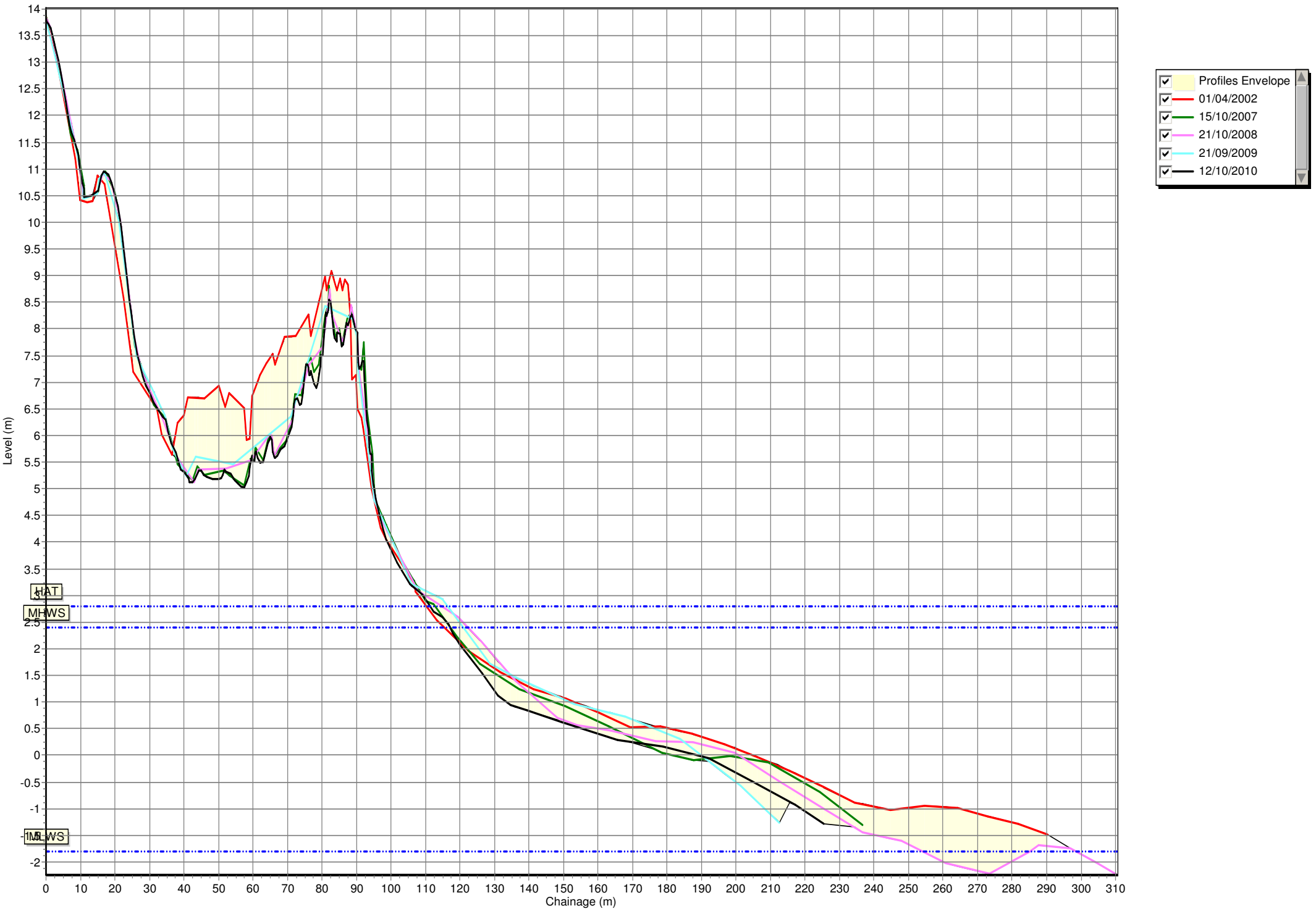
Beach Profiles: 1aBTBC12



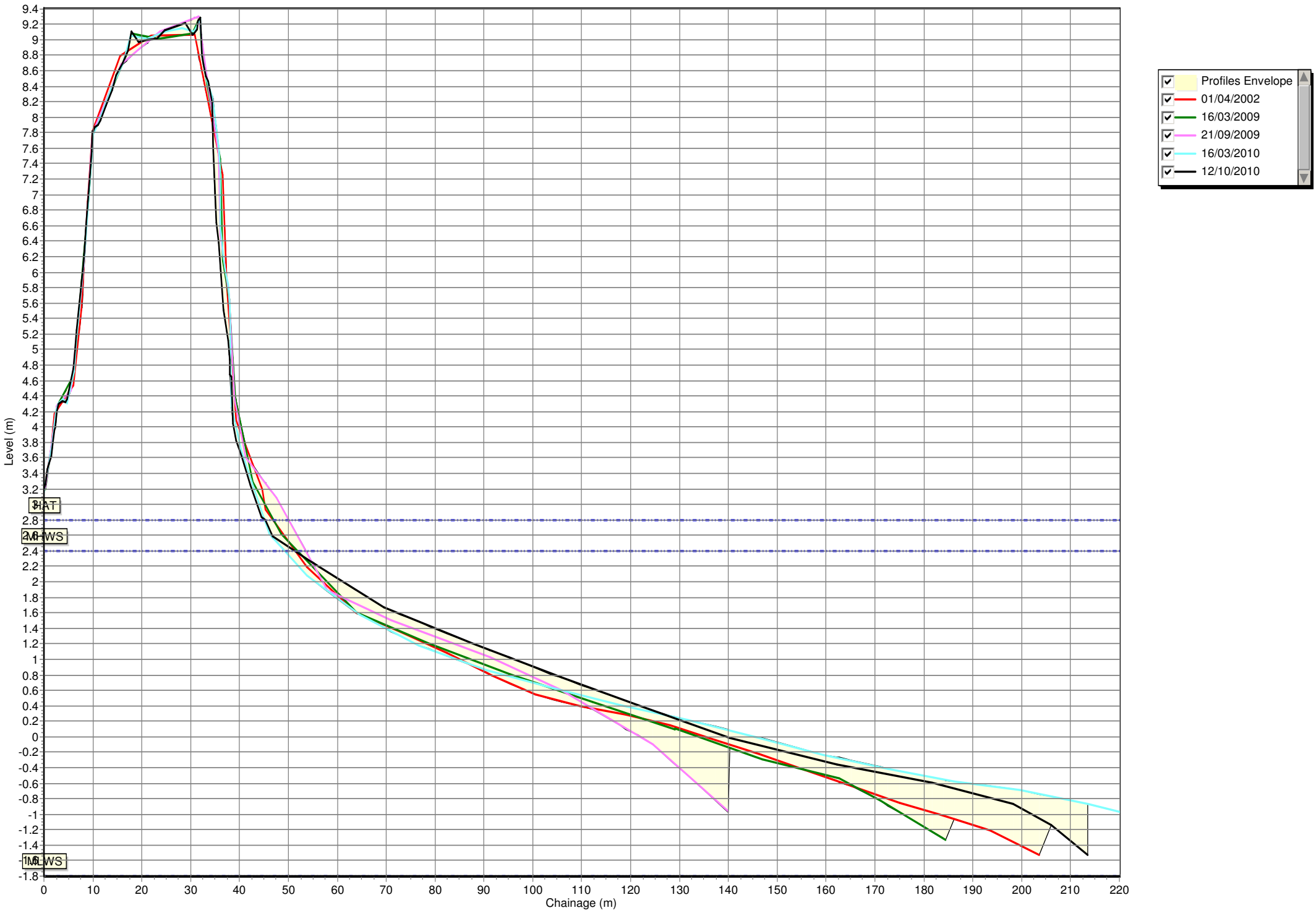
Beach Profiles: 1aBTBC13

Beach Profiles: 1aBTBC14

Beach Profiles: 1aBTBC15



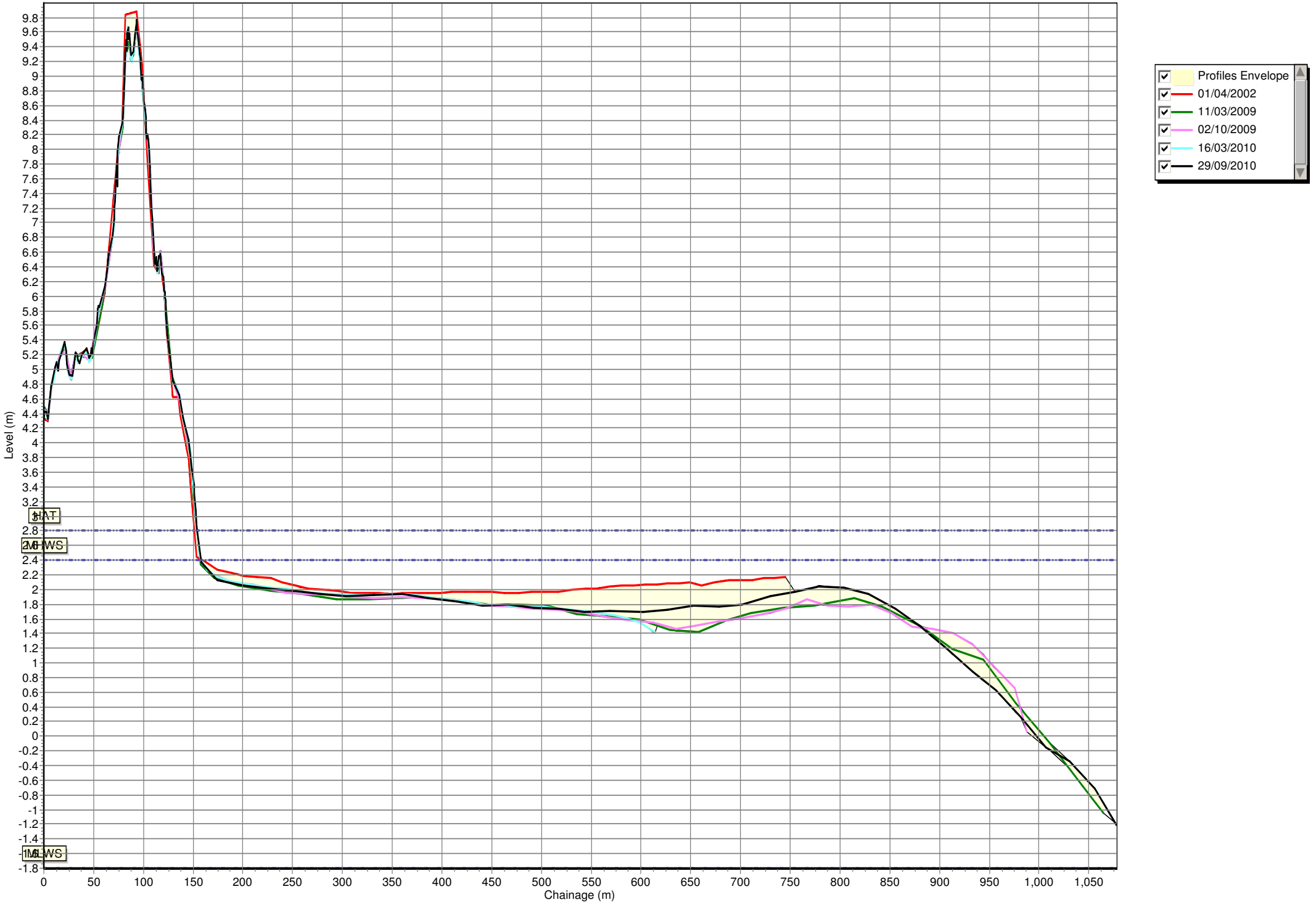
Beach Profiles: 1aBTBC16



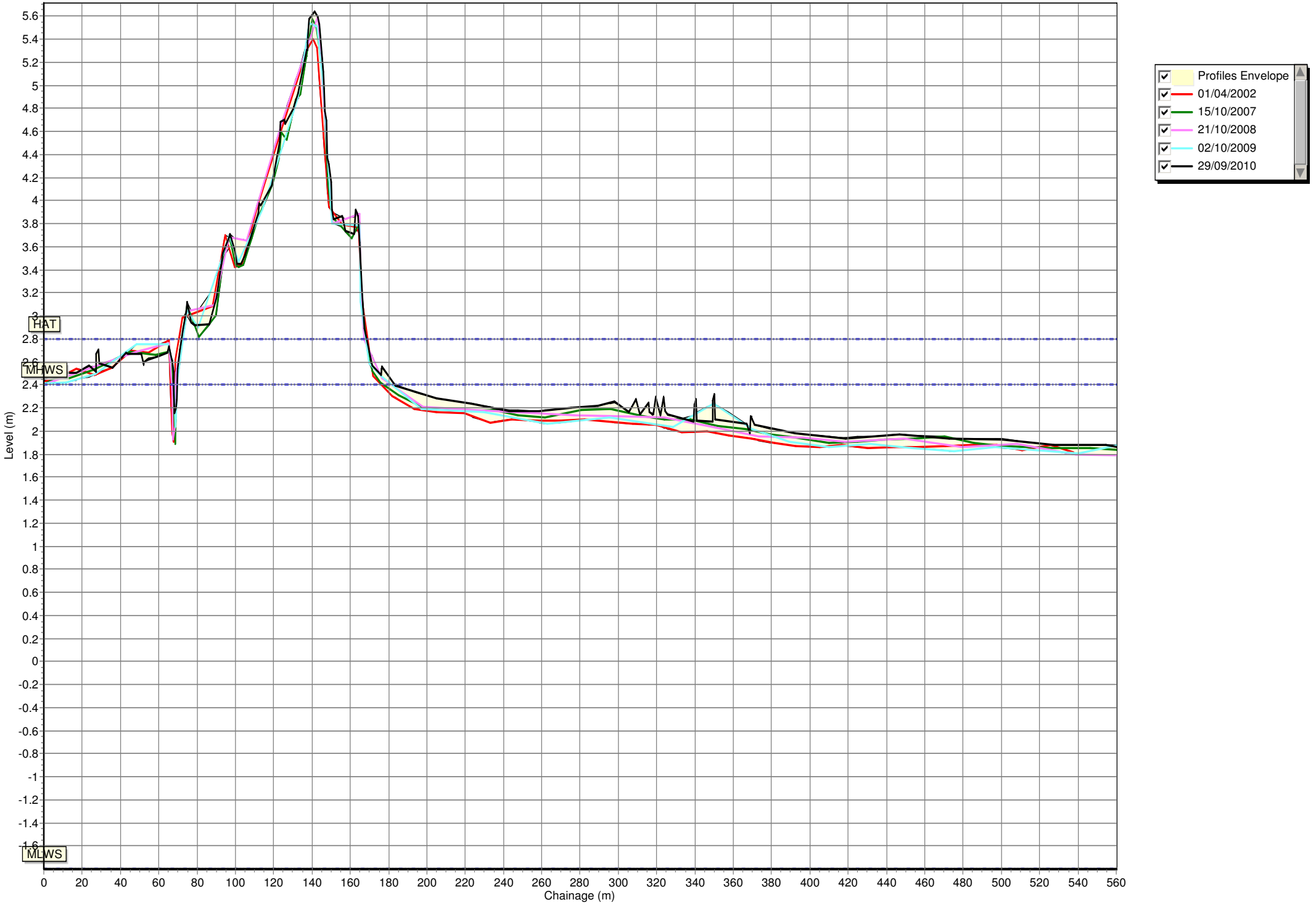
Beach Profiles: 1aBTBC17

Beach Profiles: 1aBTBC18

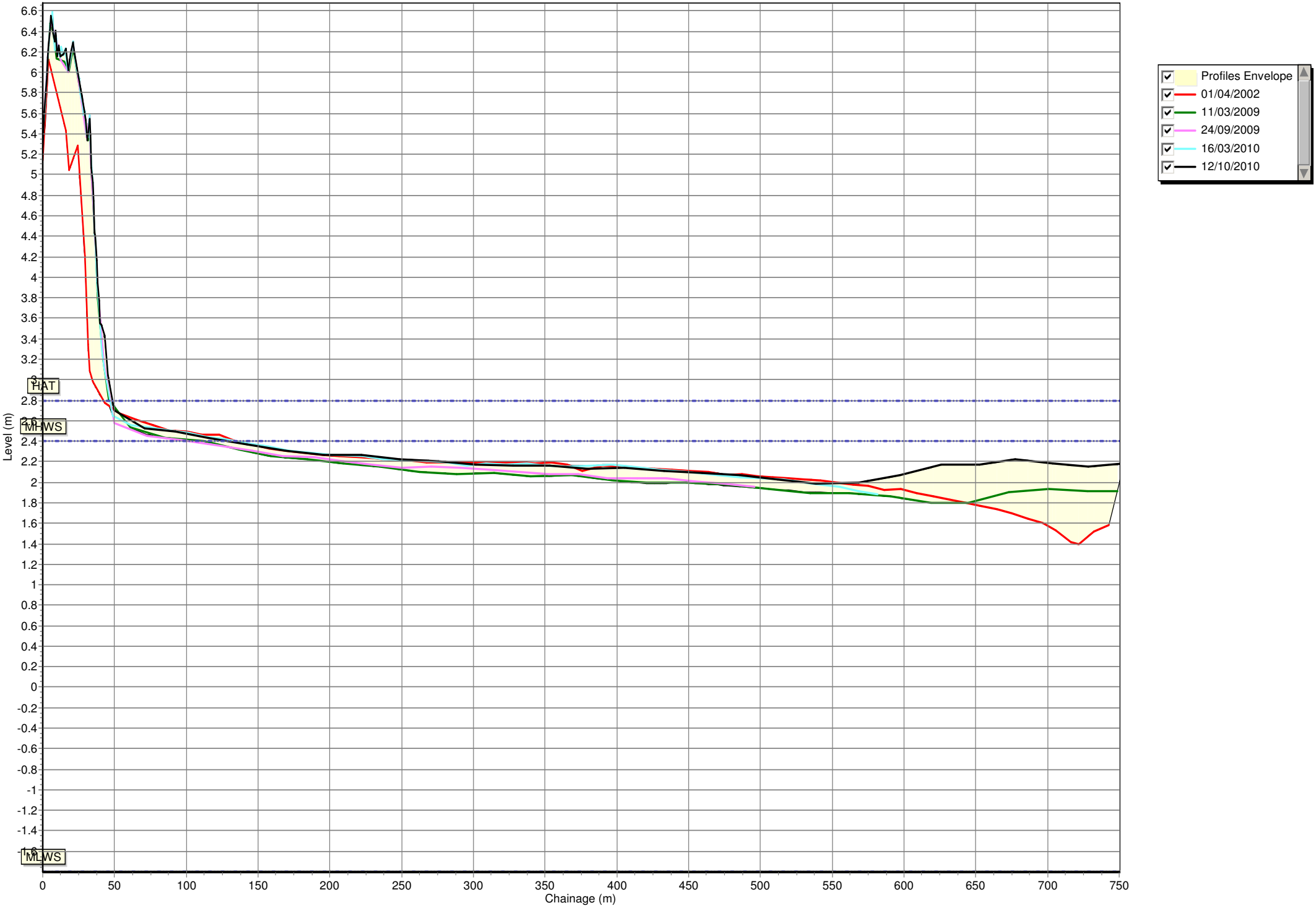
Beach Profiles: 1aBTBC19



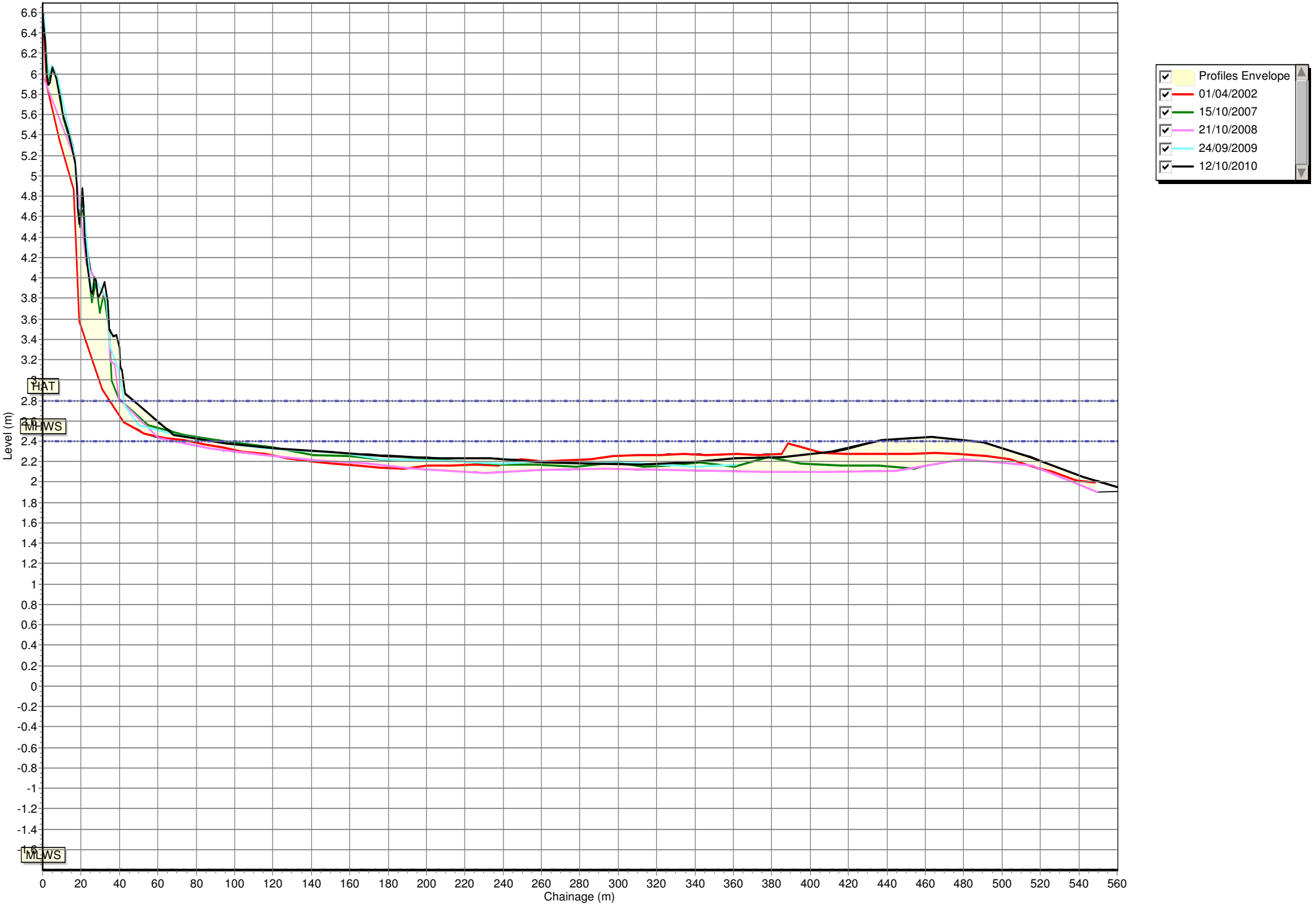
Beach Profiles: 1aBTBC20



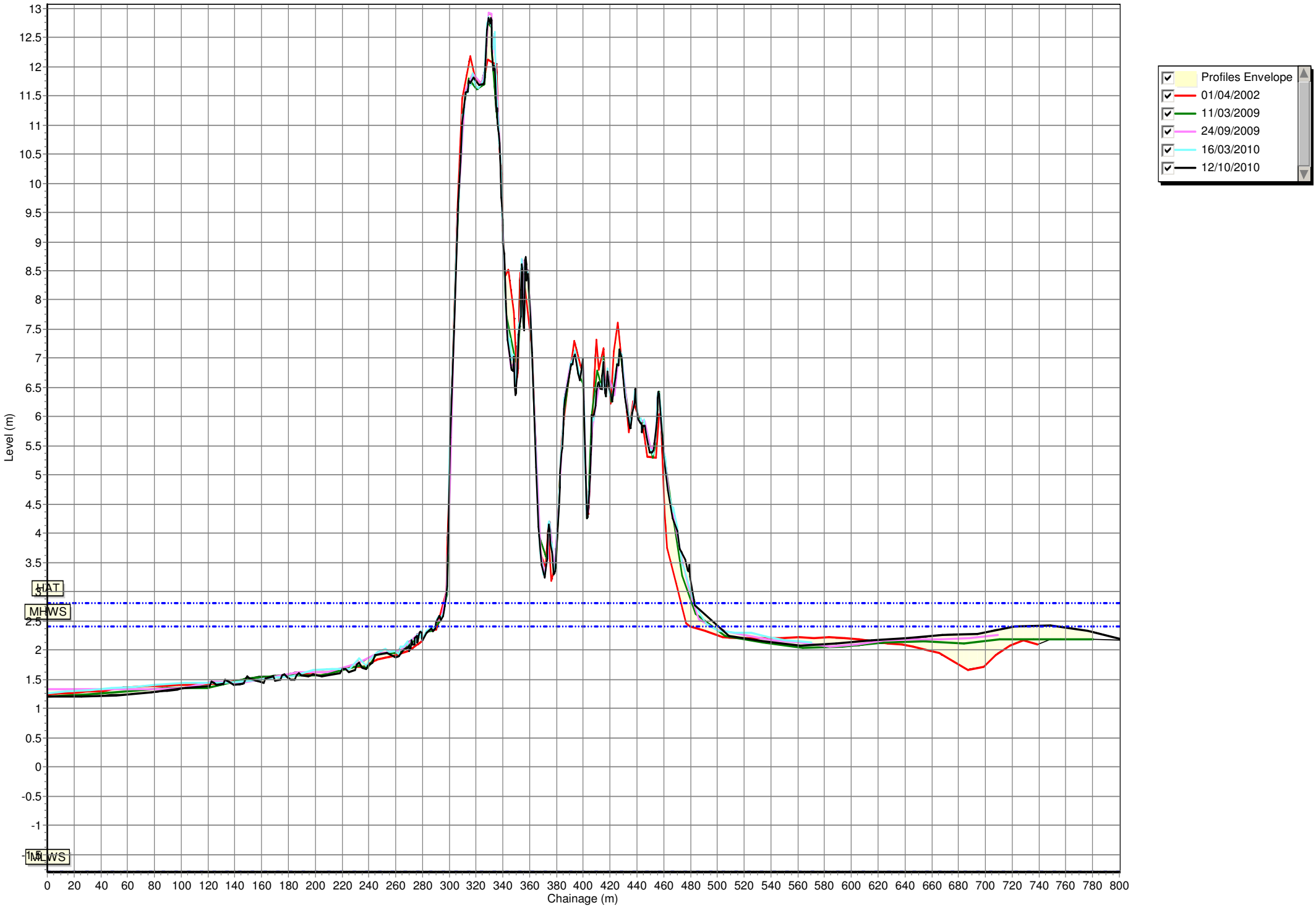
Beach Profiles: 1aBTBC21



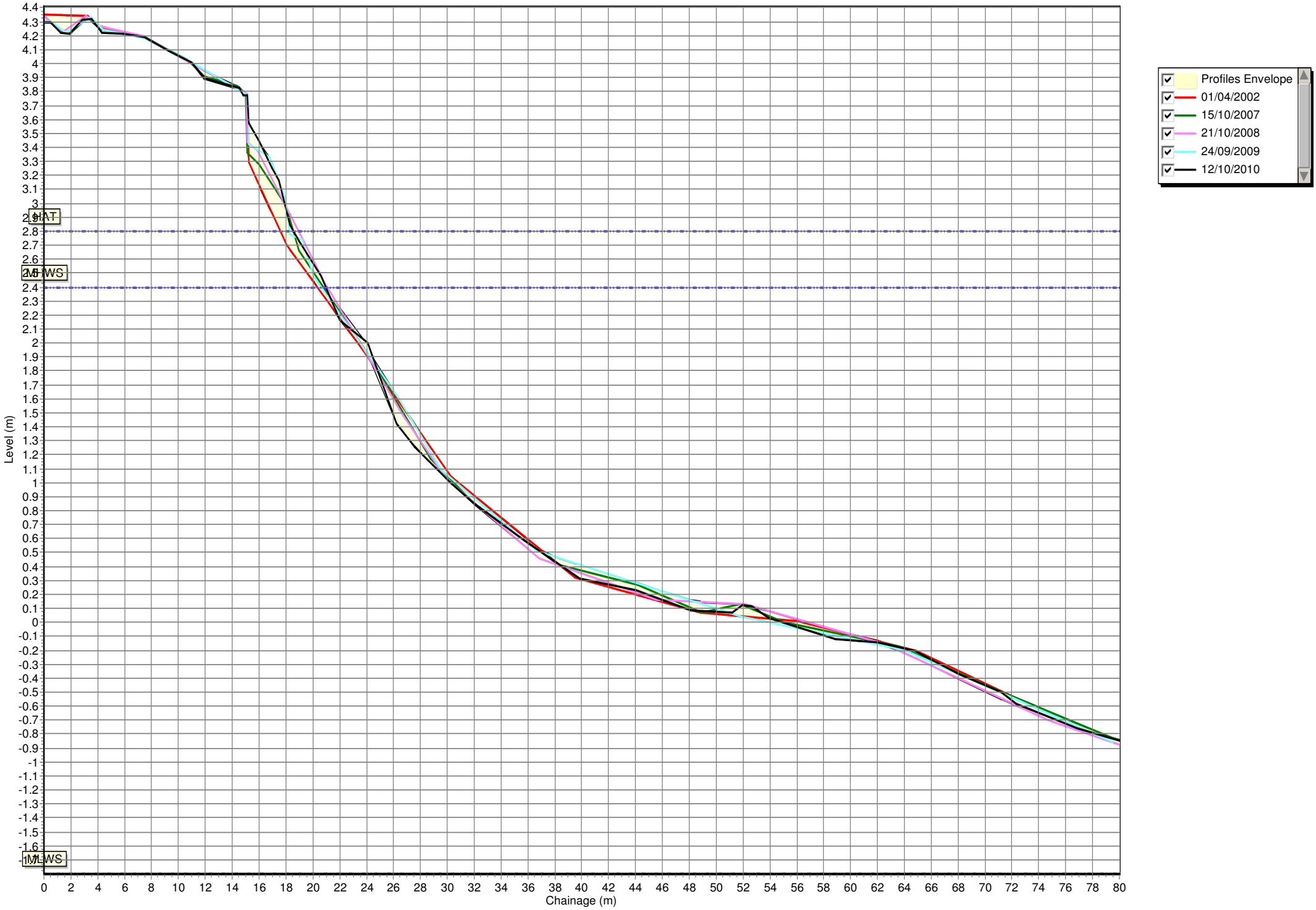
Beach Profiles: 1aBTBC22



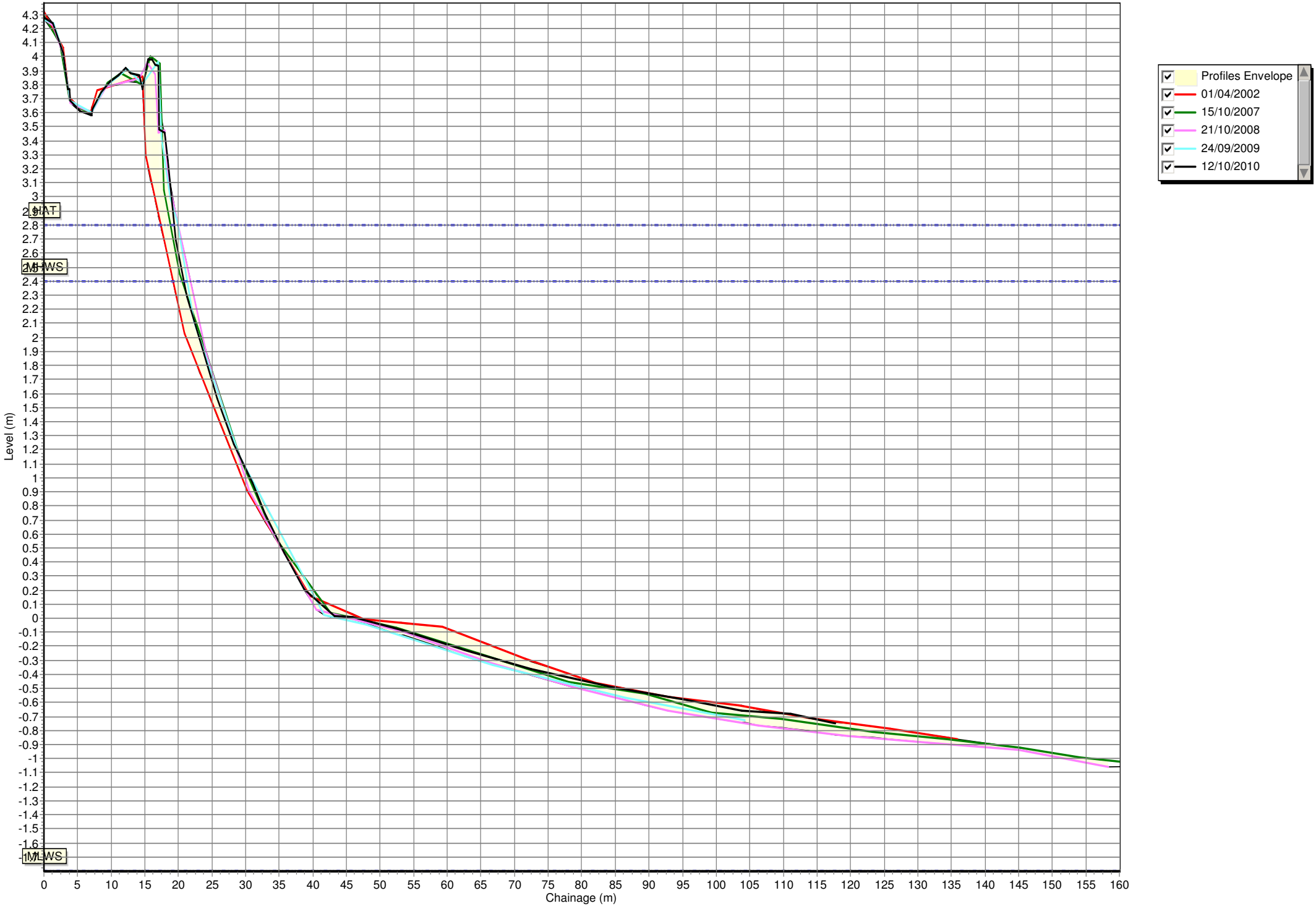
Beach Profiles: 1aBTBC23



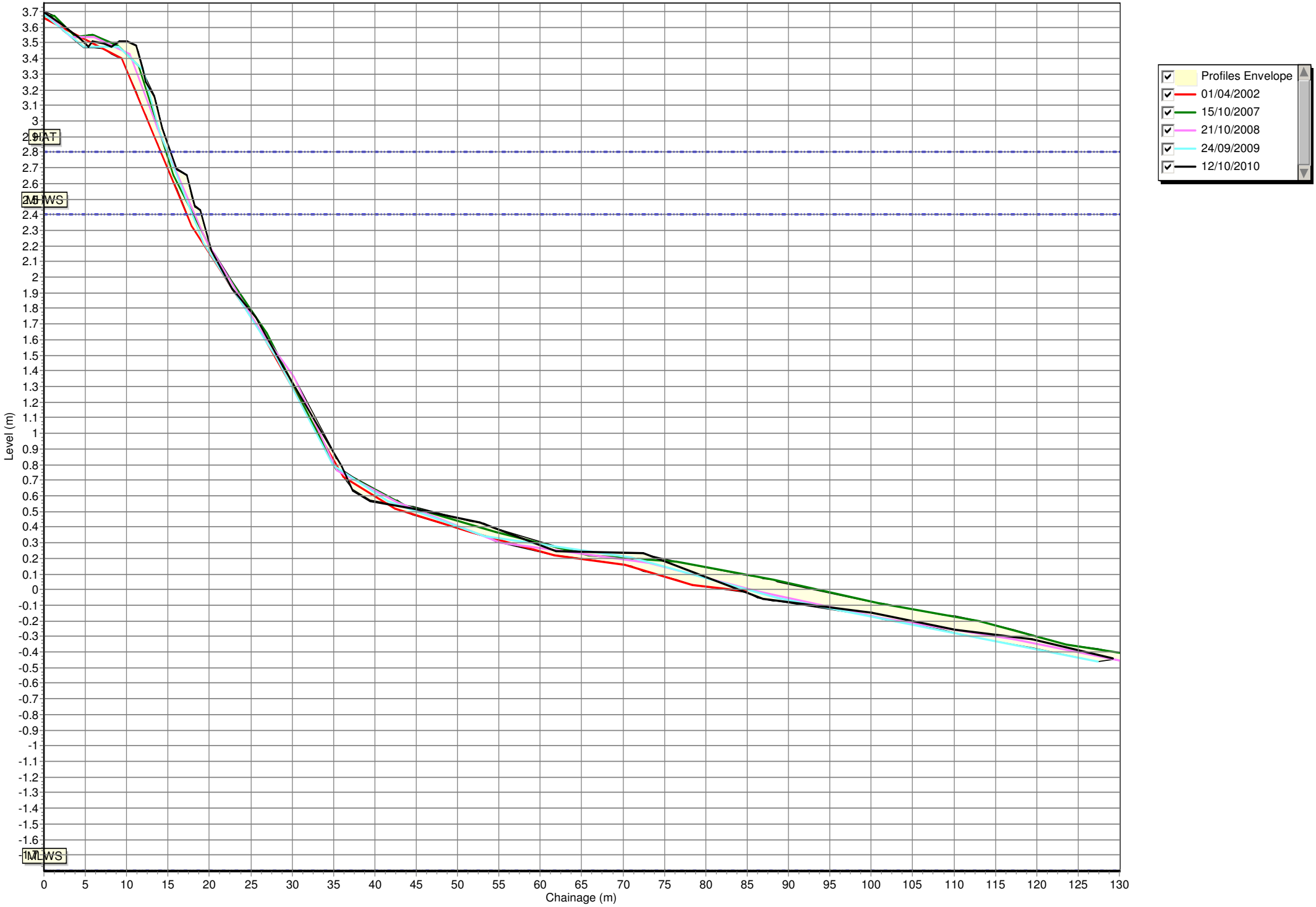
Beach Profiles: 1aBTBC24



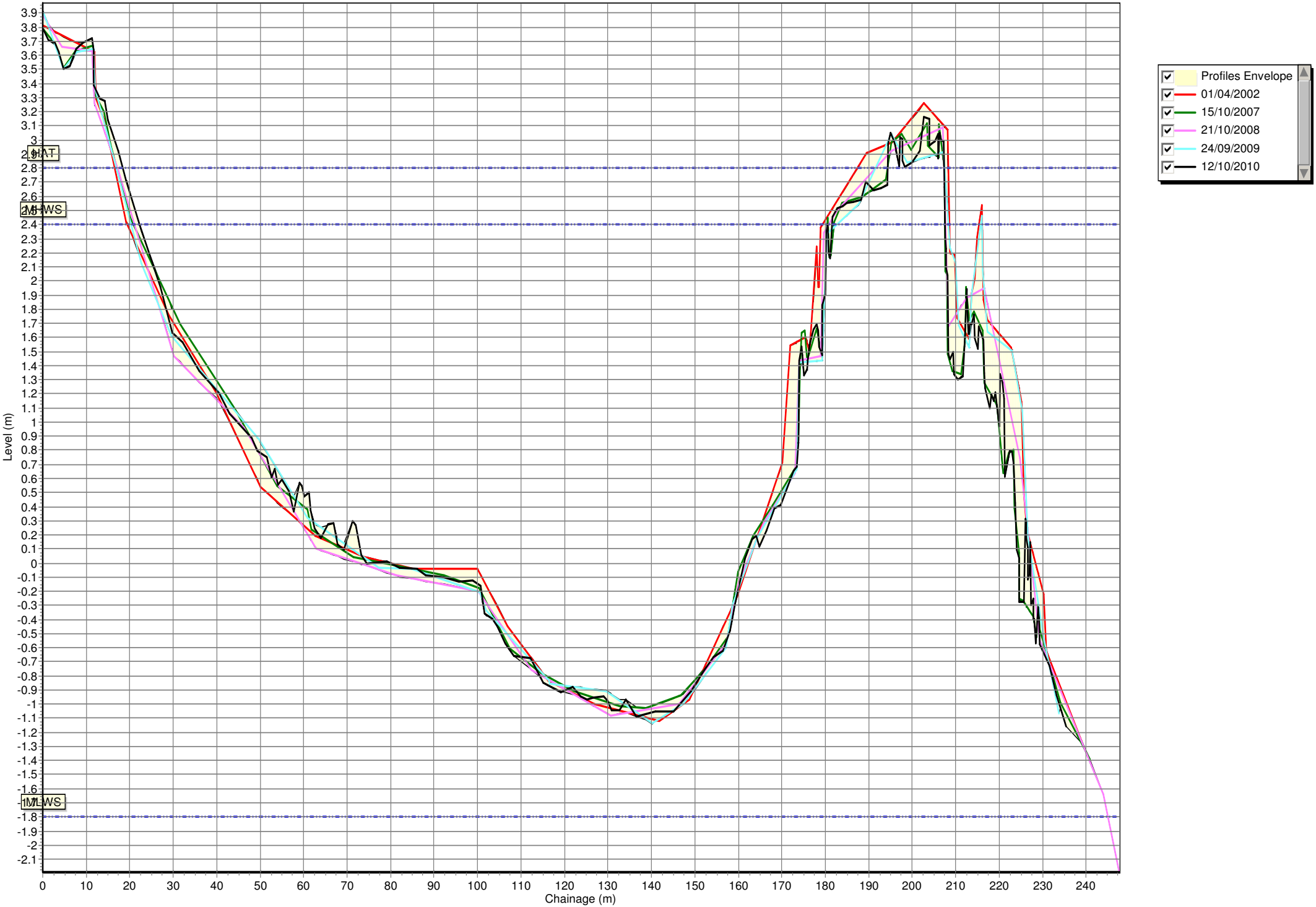
Beach Profiles: 1aBTBC25



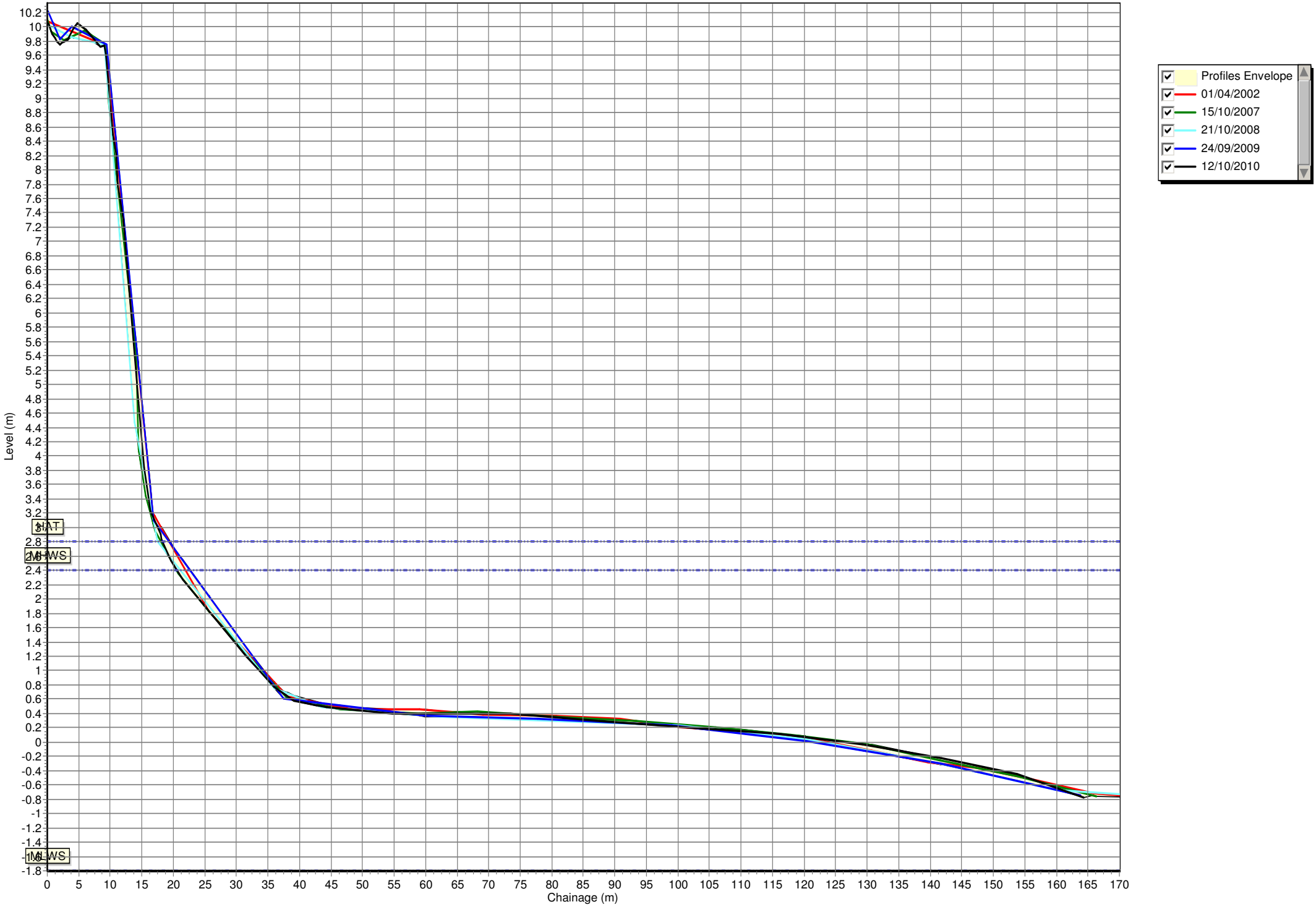
Beach Profiles: 1aBTBC26



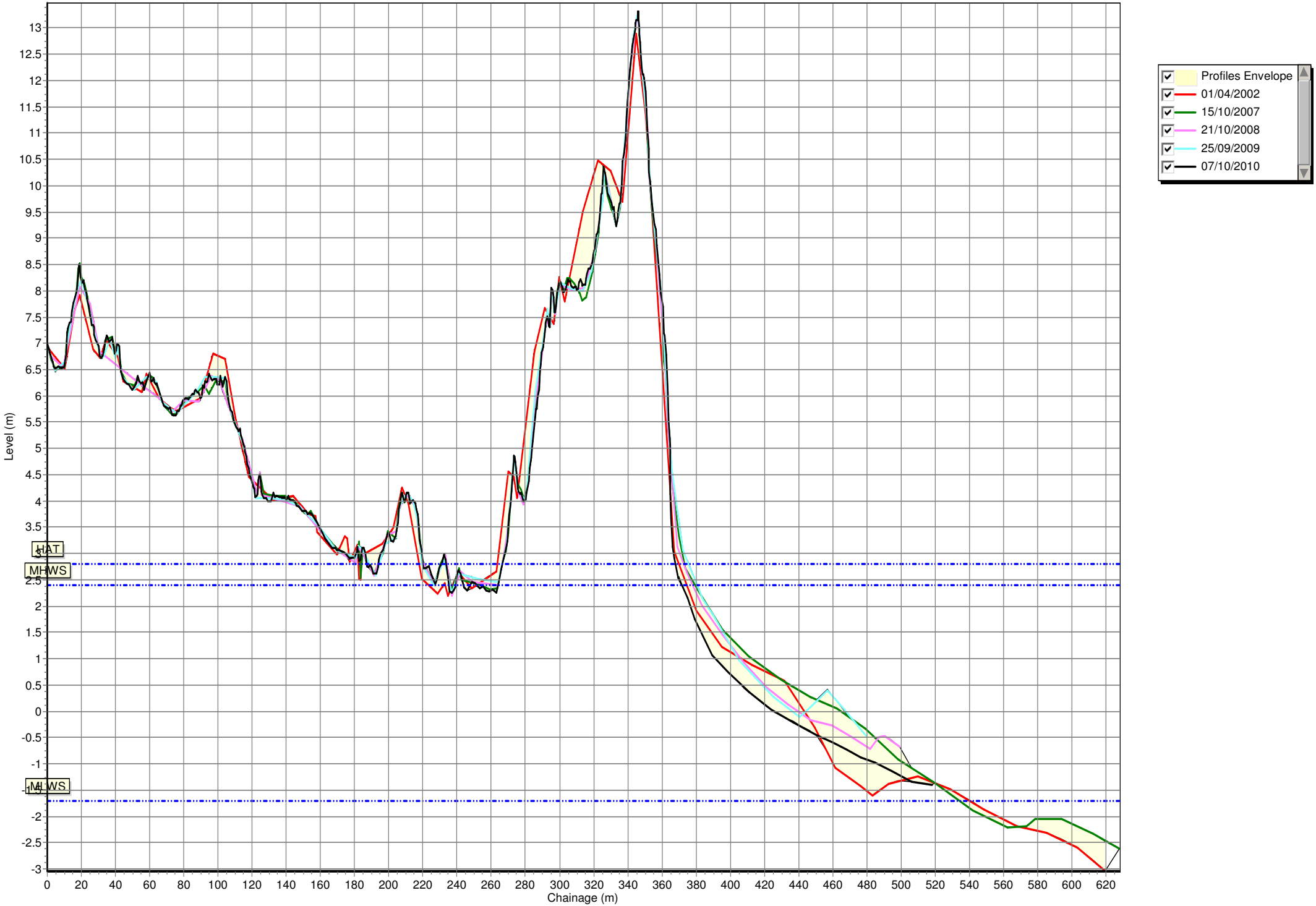
Beach Profiles: 1aBTBC27



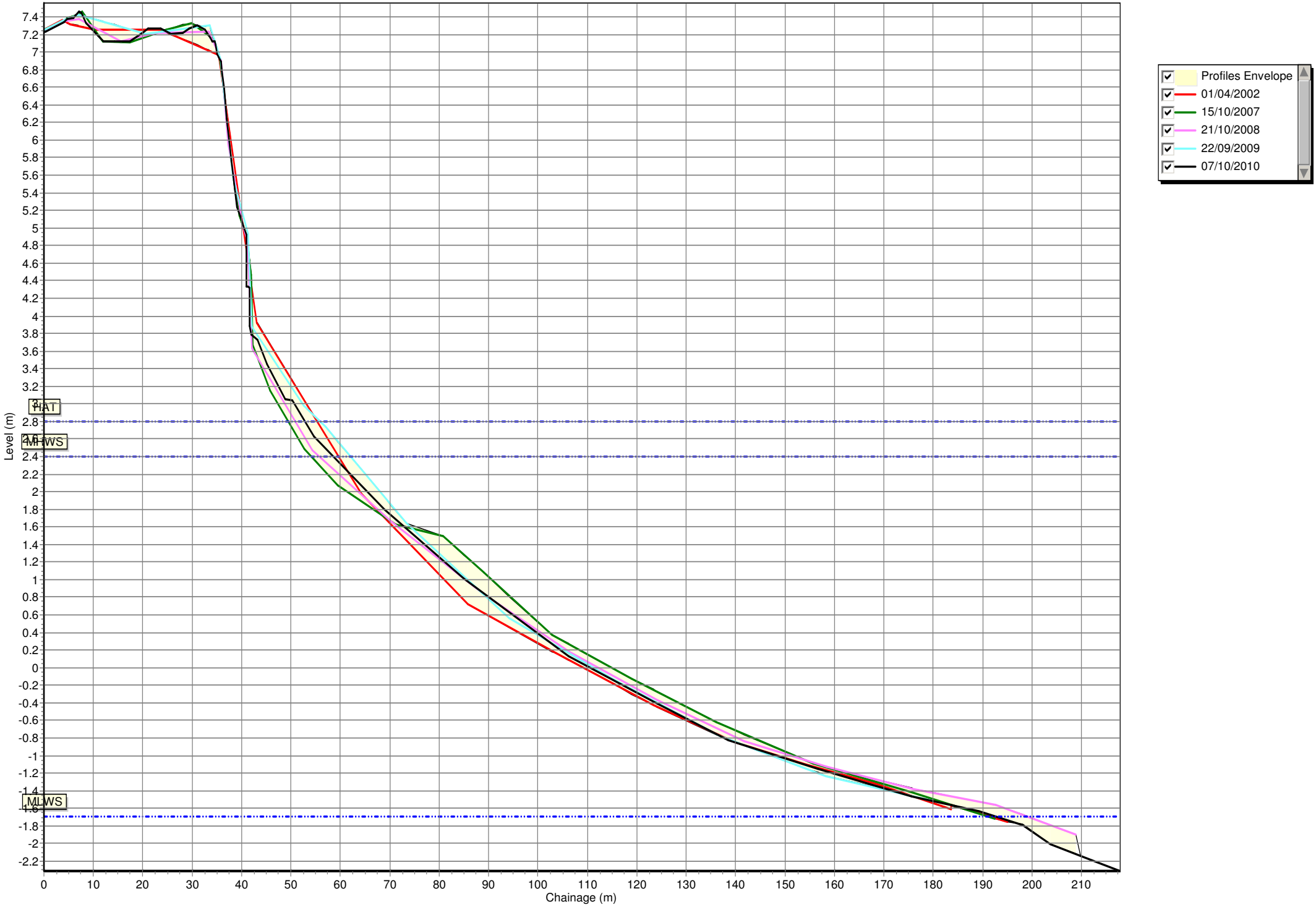
Beach Profiles: 1aBTBC28



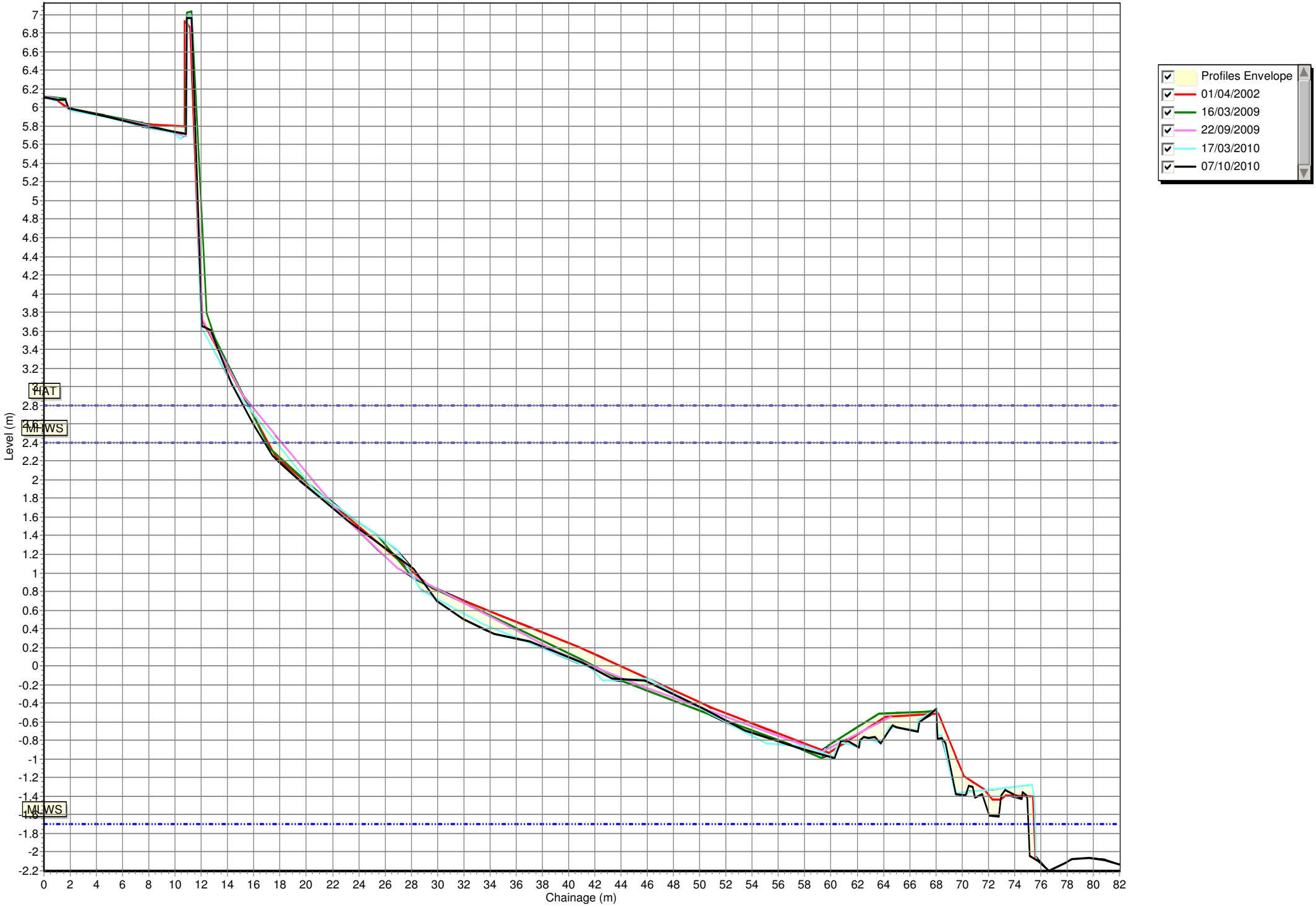
Beach Profiles: 1aBTBC29



Beach Profiles: 1aBTBC30

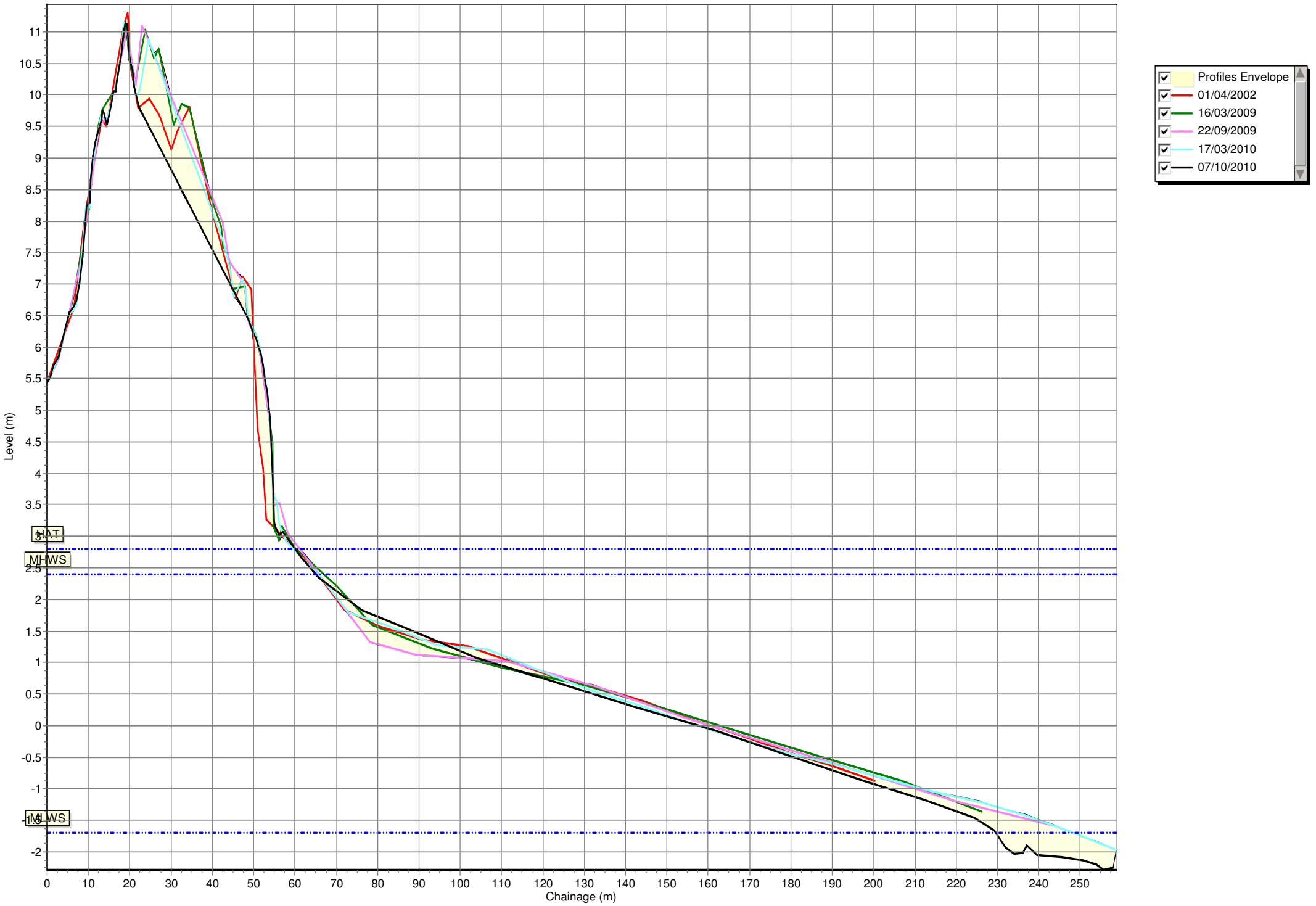


Beach Profiles: 1aBTBC31

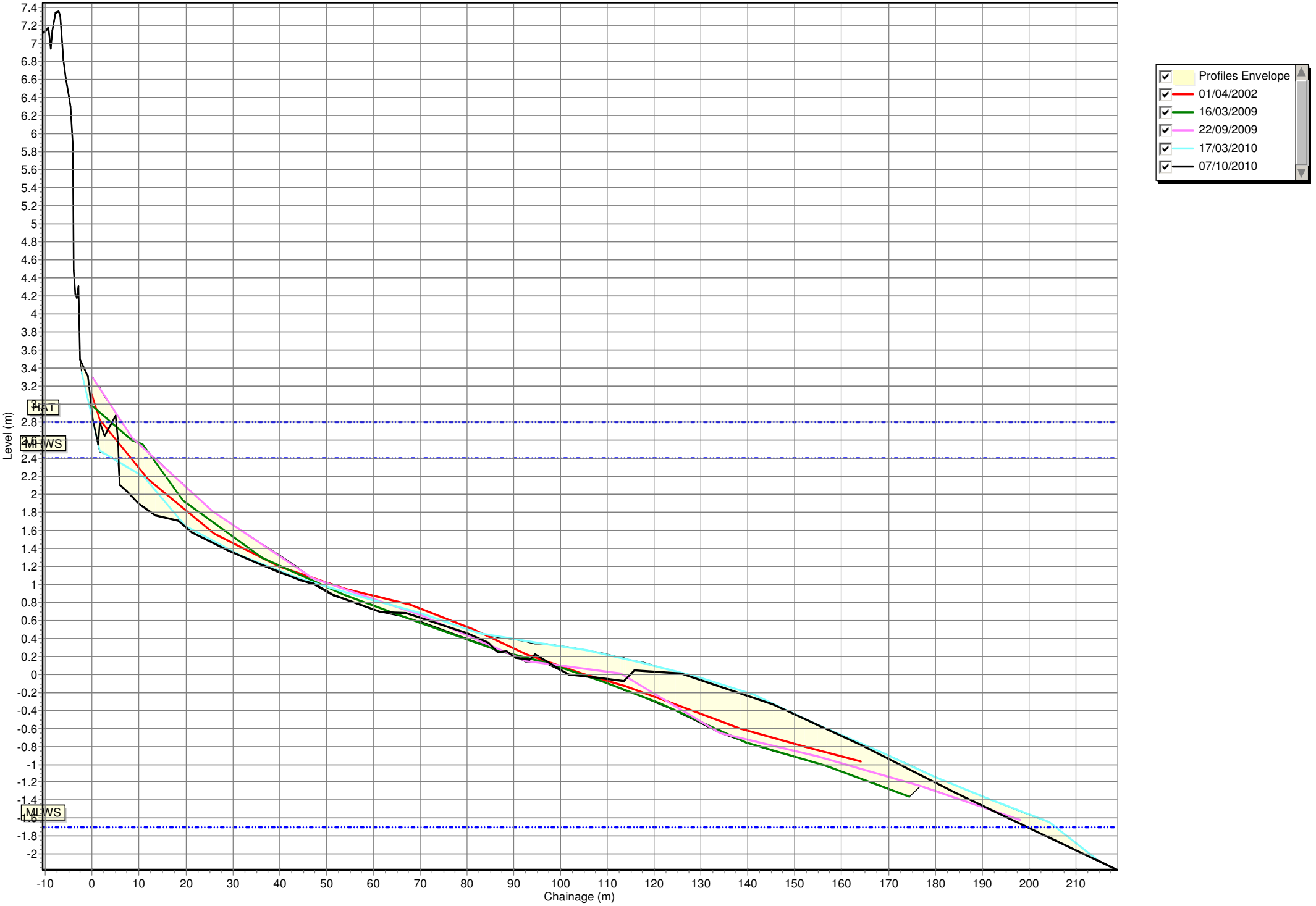


Beach Profiles: 1aBTBC32

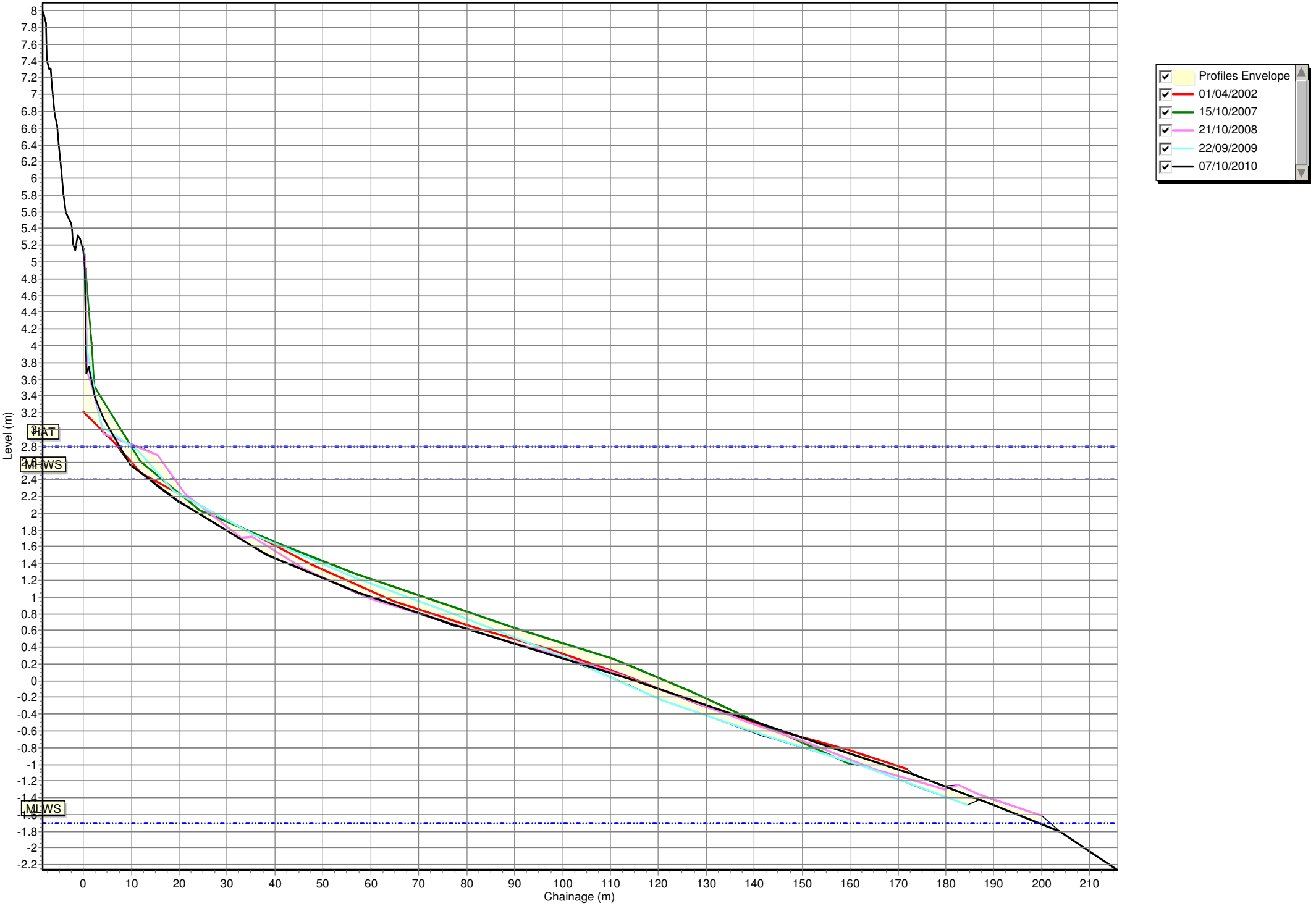
Beach Profiles: 1aBTBC33



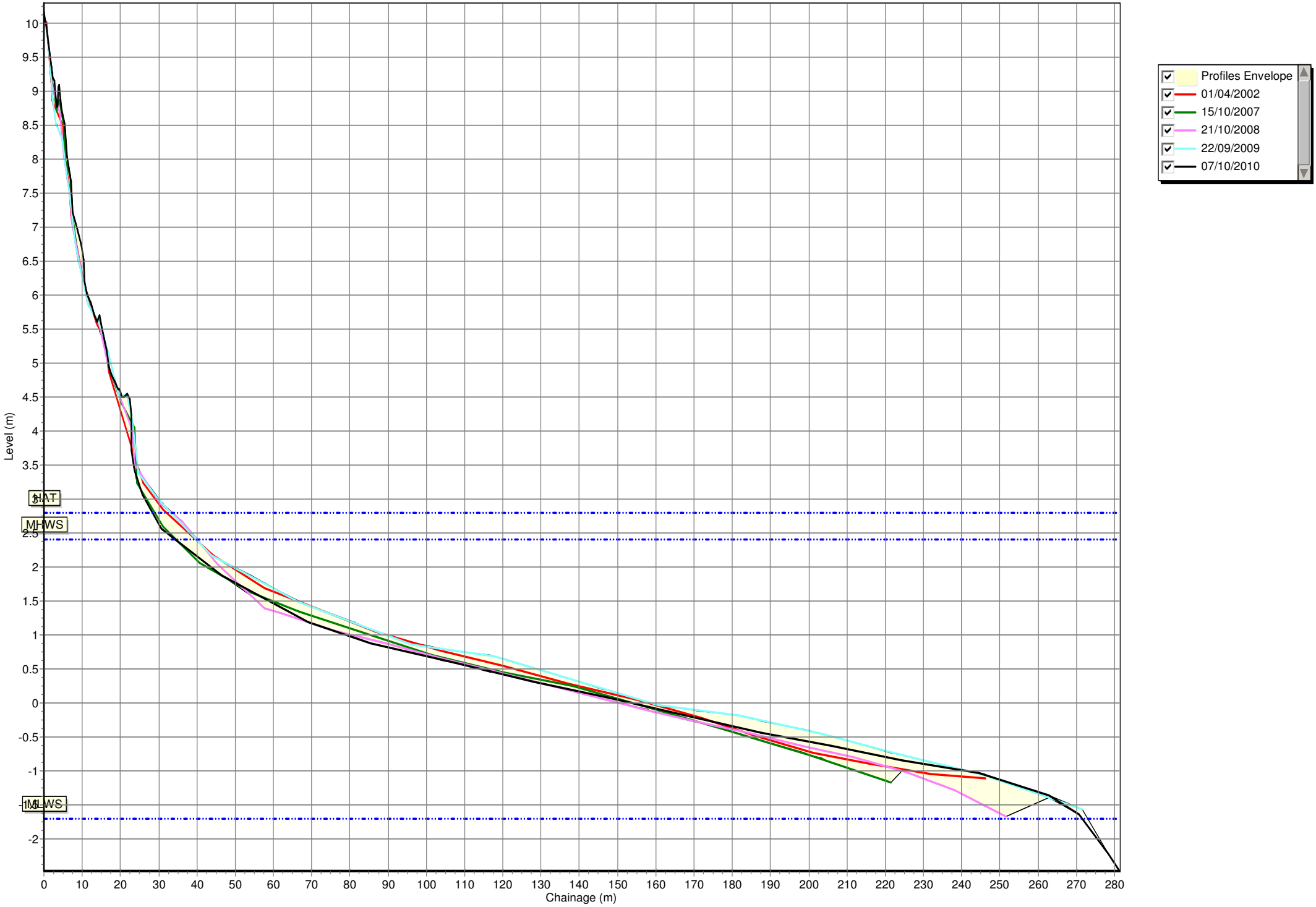
Beach Profiles: 1aBTBC34



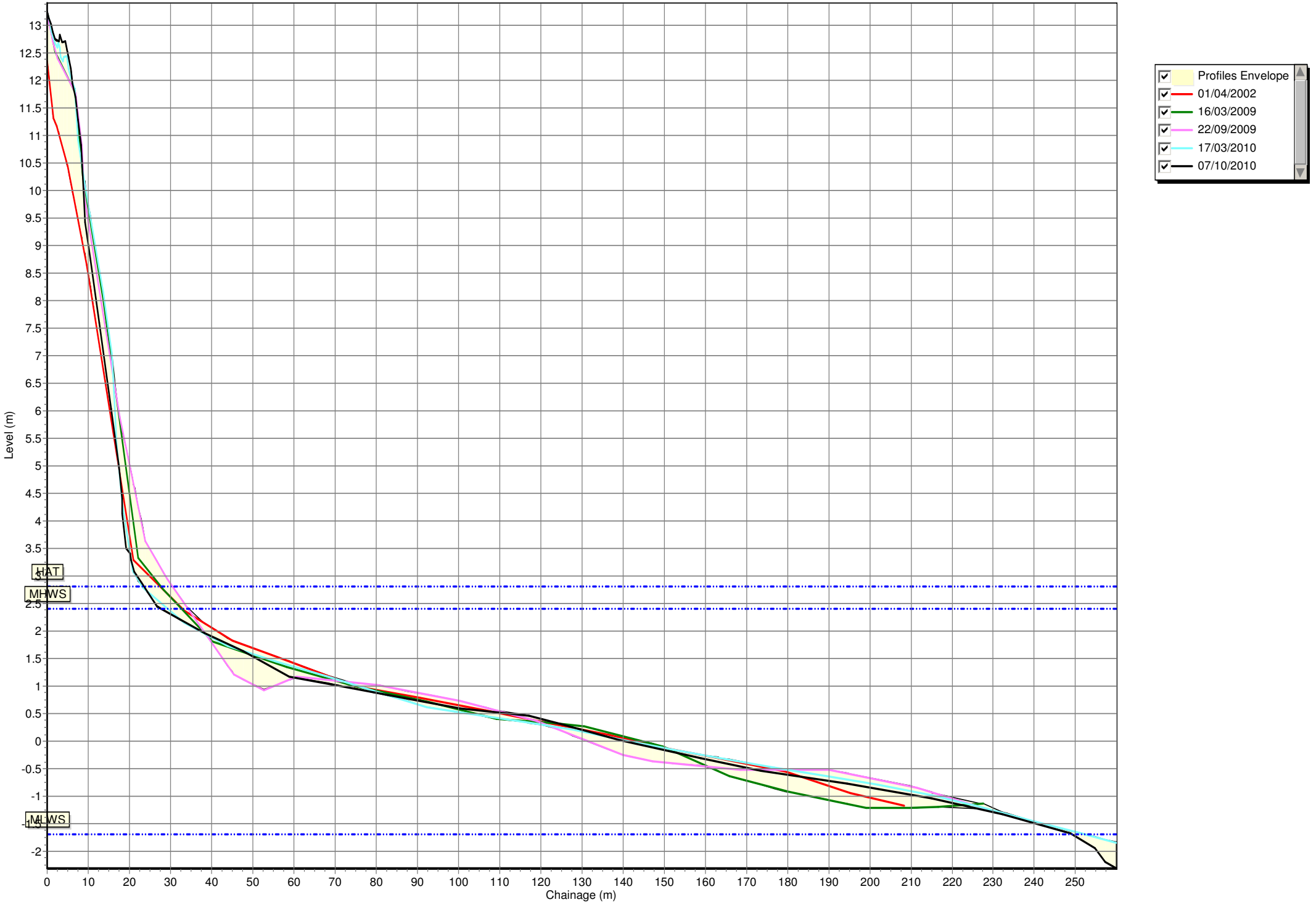
Beach Profiles: 1aBTBC35



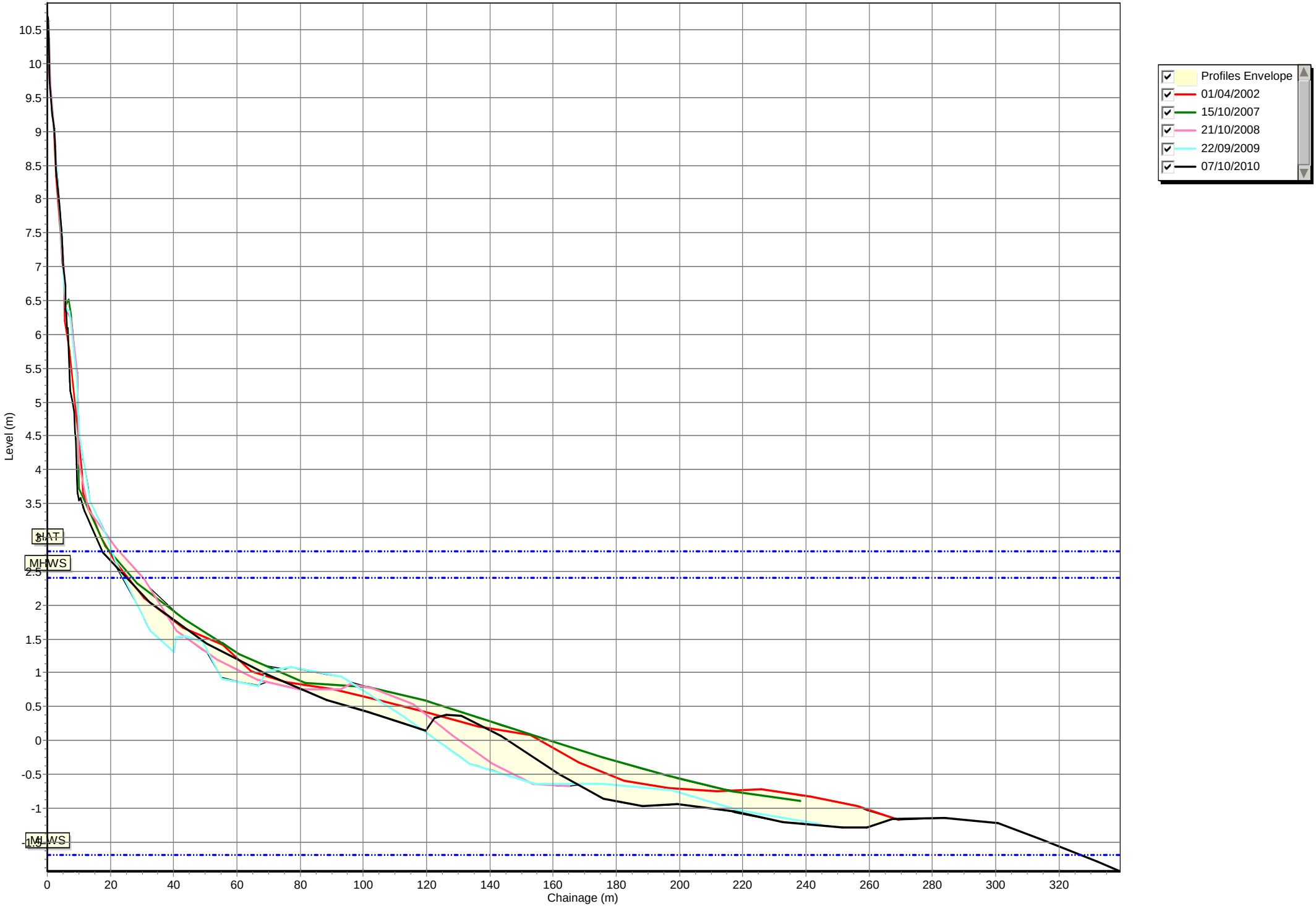
Beach Profiles: 1aBTBC36



Beach Profiles: 1aBTBC37



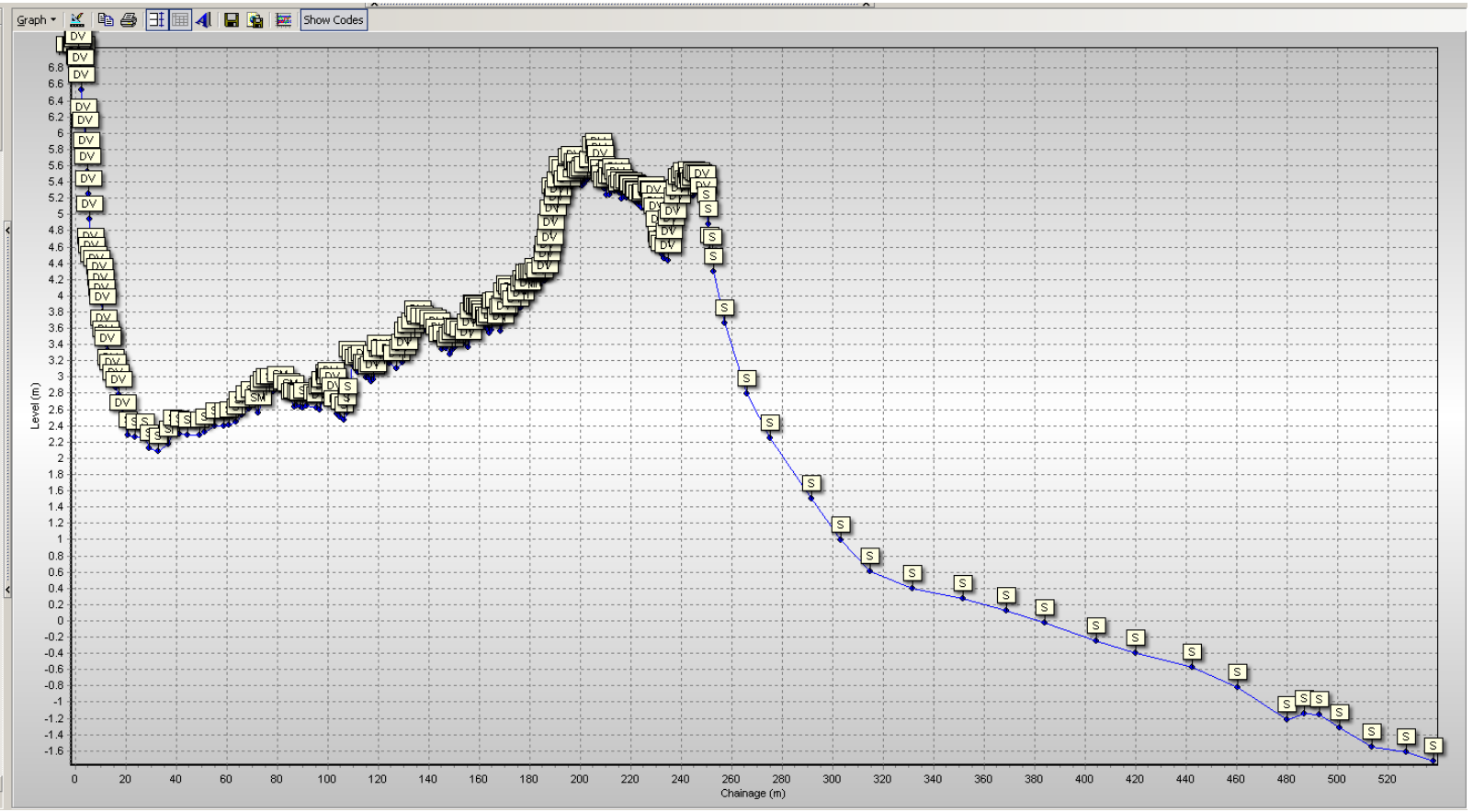
Beach Profiles: 1aBTBC38



Northumberland CC (Alnwick)

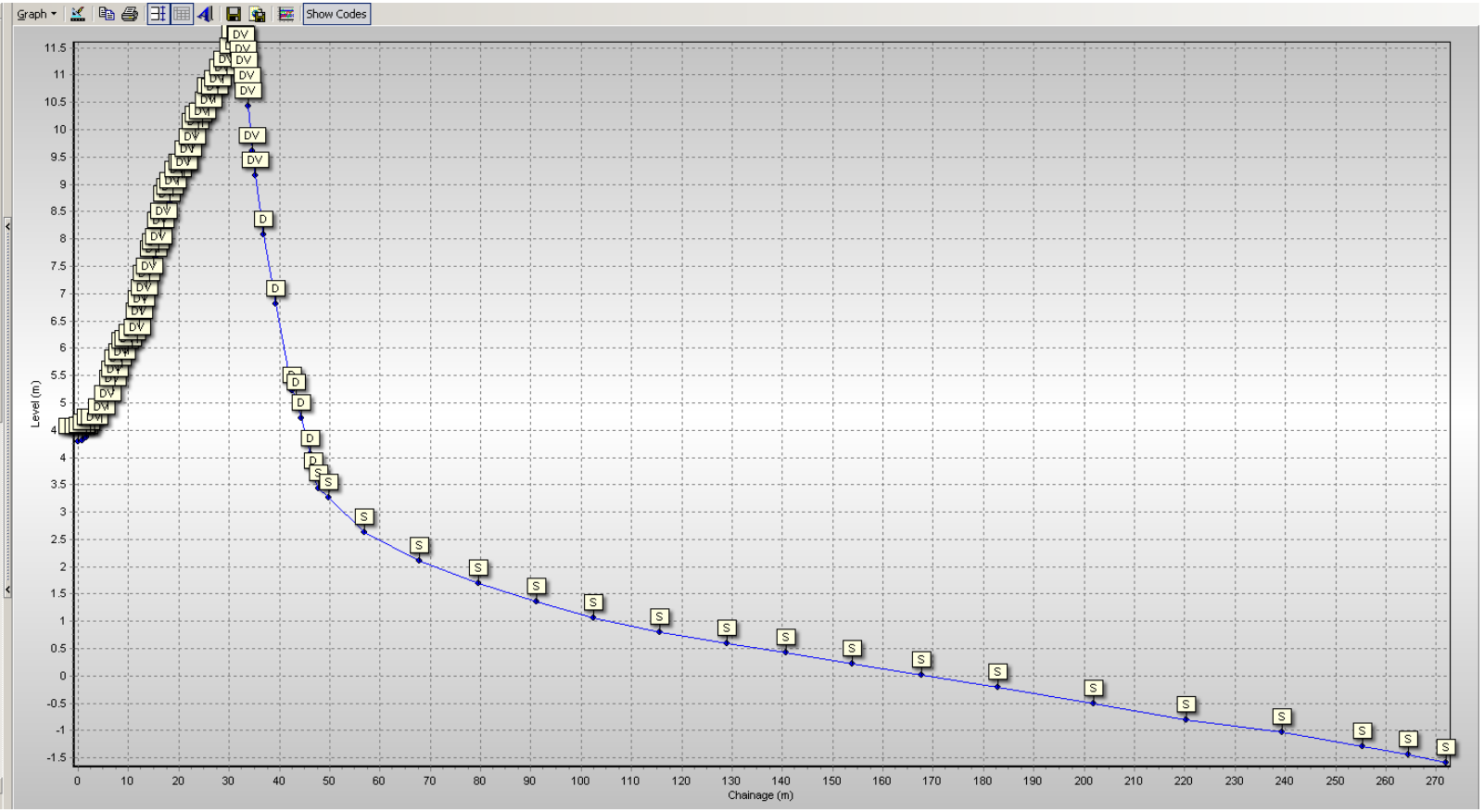
1aADC01 - 07/10/2010

Chainage	Level	Code
0.000	6.909	
0.195	6.909	DV
0.415	6.905	DV
0.672	6.962	DV
1.081	7.003	DV
1.540	6.757	DV
2.008	6.741	DV
2.497	6.533	DV
3.350	6.138	DV
4.001	5.973	DV
4.270	5.727	DV
4.852	5.531	DV
5.367	5.255	DV
5.767	4.946	DV
6.137	4.546	DV
6.590	4.427	DV
7.347	4.326	DV
8.453	4.273	DV
9.463	4.169	DV
10.012	4.030	DV
10.386	3.910	DV
10.929	3.805	DV
11.311	3.536	DV
11.920	3.406	DV
12.800	3.324	DV
12.971	3.287	DV
13.856	3.058	DV
14.888	2.991	DV
15.958	2.871	DV
17.025	2.779	DV
18.888	2.498	DV
20.804	2.285	S
23.598	2.261	S
27.526	2.263	S
29.270	2.118	S
32.774	2.083	S
36.689	2.173	S
38.519	2.303	S
41.145	2.298	S
44.612	2.286	S
49.272	2.289	S
51.026	2.320	S



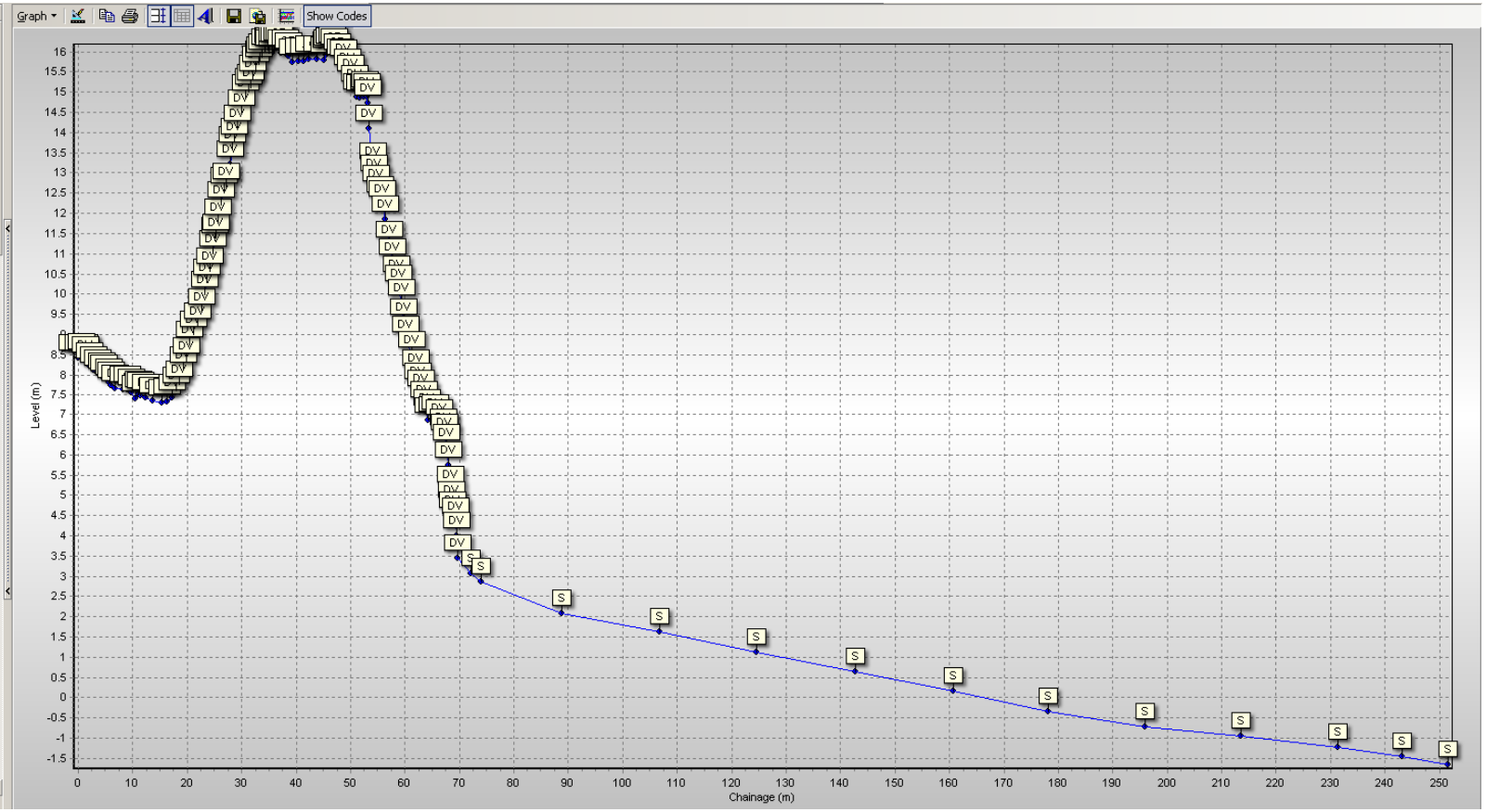
1aADC02 - 07/10/2010

Chainage	Level	Code
0.000	4.298	
0.101	4.298	DV
0.800	4.308	DV
1.550	4.364	DV
2.504	4.452	DV
3.325	4.466	DV
4.734	4.643	DV
5.819	4.894	DV
6.897	5.162	DV
7.315	5.338	DV
7.848	5.540	DV
8.659	5.649	DV
9.286	5.854	DV
9.851	5.895	DV
10.832	6.015	DV
11.649	6.108	DV
12.098	6.405	DV
12.606	6.631	DV
13.123	6.830	DV
13.549	7.087	DV
14.154	7.220	DV
14.944	7.532	DV
15.484	7.658	DV
15.929	7.767	DV
16.446	8.066	DV
16.937	8.234	DV
17.613	8.540	DV
18.277	8.683	DV
18.883	8.779	DV
19.866	8.985	DV
20.742	9.117	DV
21.101	9.127	DV
21.969	9.358	DV
22.581	9.585	DV
23.319	9.878	DV
23.945	10.004	DV
24.750	10.061	DV
25.905	10.256	DV
26.363	10.524	DV
27.080	10.510	DV
27.759	10.657	DV
28.840	10.850	DV



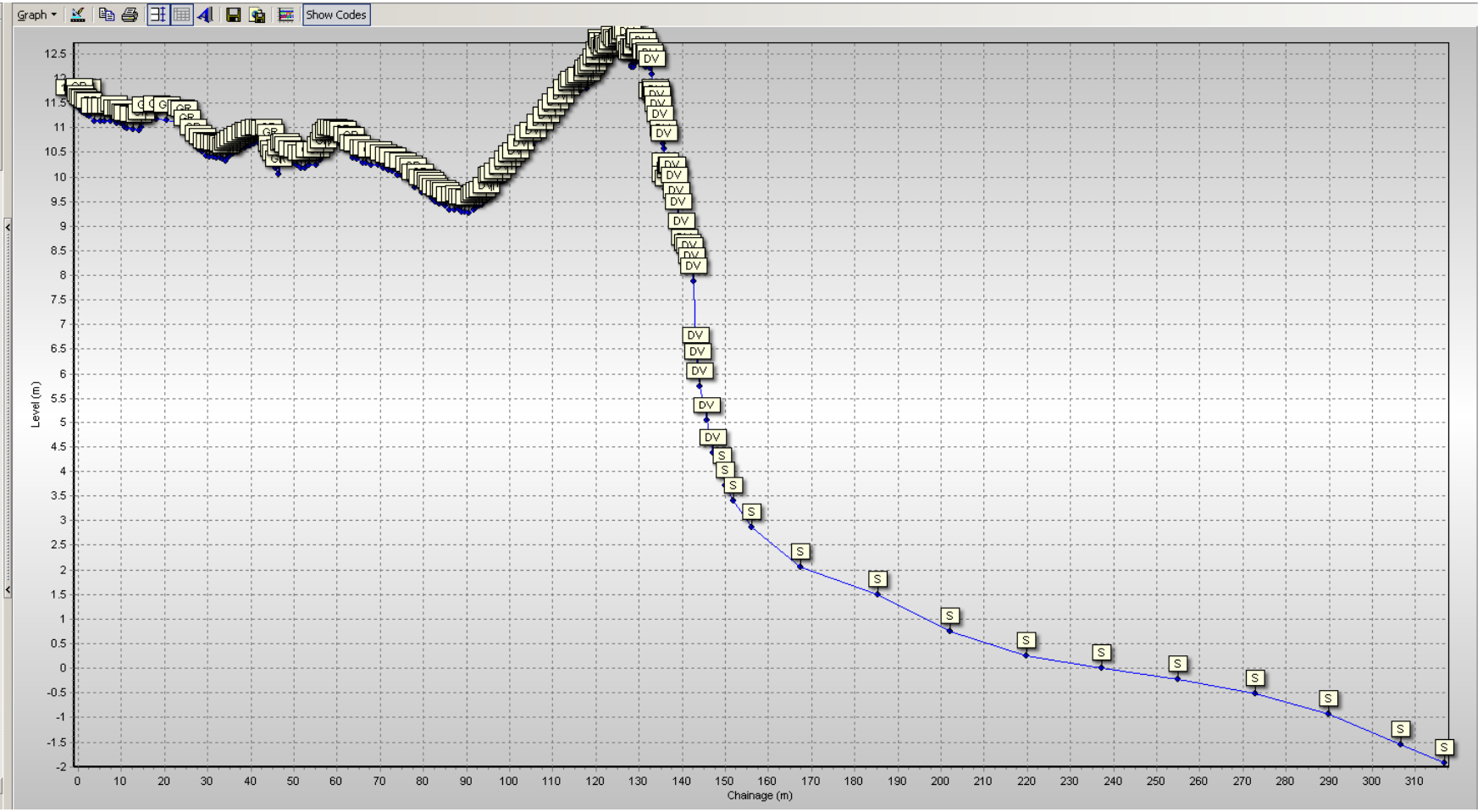
1aADC03 - 11/10/2010

Chainage	Level	Code
0.000	8.422	
0.058	8.422	DV
0.546	8.433	DV
1.243	8.354	DV
2.149	8.224	DV
2.726	8.106	DV
3.577	8.037	DV
4.373	7.961	DV
4.722	7.908	DV
5.623	7.810	DV
6.067	7.735	DV
6.682	7.668	DV
8.222	7.635	DV
9.069	7.622	DV
9.721	7.548	DV
10.442	7.415	DV
11.054	7.511	DV
11.419	7.487	DV
12.350	7.423	DV
13.746	7.348	DV
15.337	7.317	DV
16.384	7.328	DV
17.240	7.438	DV
17.905	7.618	DV
18.490	7.768	DV
19.297	8.121	DV
19.764	8.332	DV
20.491	8.742	DV
21.108	8.990	DV
21.864	9.195	DV
22.616	9.549	DV
23.307	9.984	DV
23.628	10.287	DV
24.178	10.567	DV
24.771	11.000	DV
25.086	11.313	DV
25.332	11.400	DV
25.732	11.770	DV
26.196	12.214	DV
26.717	12.550	DV
27.196	12.667	DV
27.846	13.223	DV



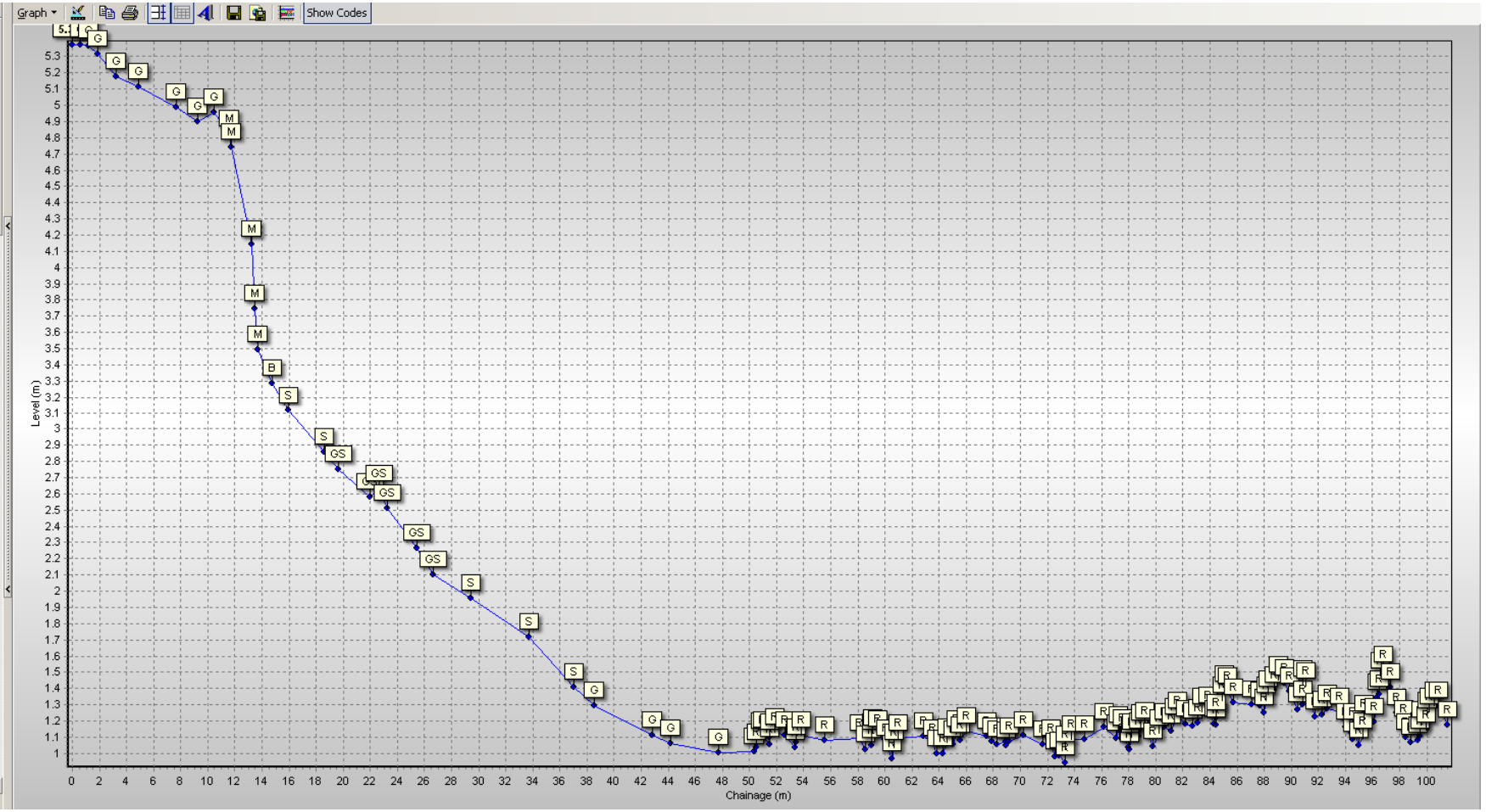
1aADC04 - 11/10/2010

Chainage	Level	Code
0.000	11.497	
0.032	11.497	GR
0.337	11.522	GR
0.576	11.383	GR
0.990	11.321	GR
1.368	11.297	ZZ
2.037	11.253	ZZ
2.670	11.237	ZZ
3.880	11.133	GR
5.217	11.131	GR
6.232	11.133	GR
7.448	11.129	GR
8.151	11.172	GR
9.053	11.093	GR
9.847	11.090	GR
10.366	11.083	GR
10.953	11.004	GR
11.359	10.985	ZZ
12.798	10.956	ZZ
14.122	10.950	ZZ
14.653	11.006	GR
15.680	11.141	GR
18.100	11.167	GR
20.484	11.148	GR
23.724	11.097	GR
24.490	11.058	GR
25.330	10.881	GR
26.574	10.691	GR
27.840	10.578	GR
28.829	10.499	GR
29.709	10.425	GR
30.476	10.414	GR
31.368	10.403	GR
32.119	10.378	GR
32.917	10.381	GR
33.554	10.355	GR
34.125	10.324	GR
34.756	10.381	GR
35.151	10.427	GR
35.960	10.468	GR
36.673	10.510	GR
37.583	10.543	GR



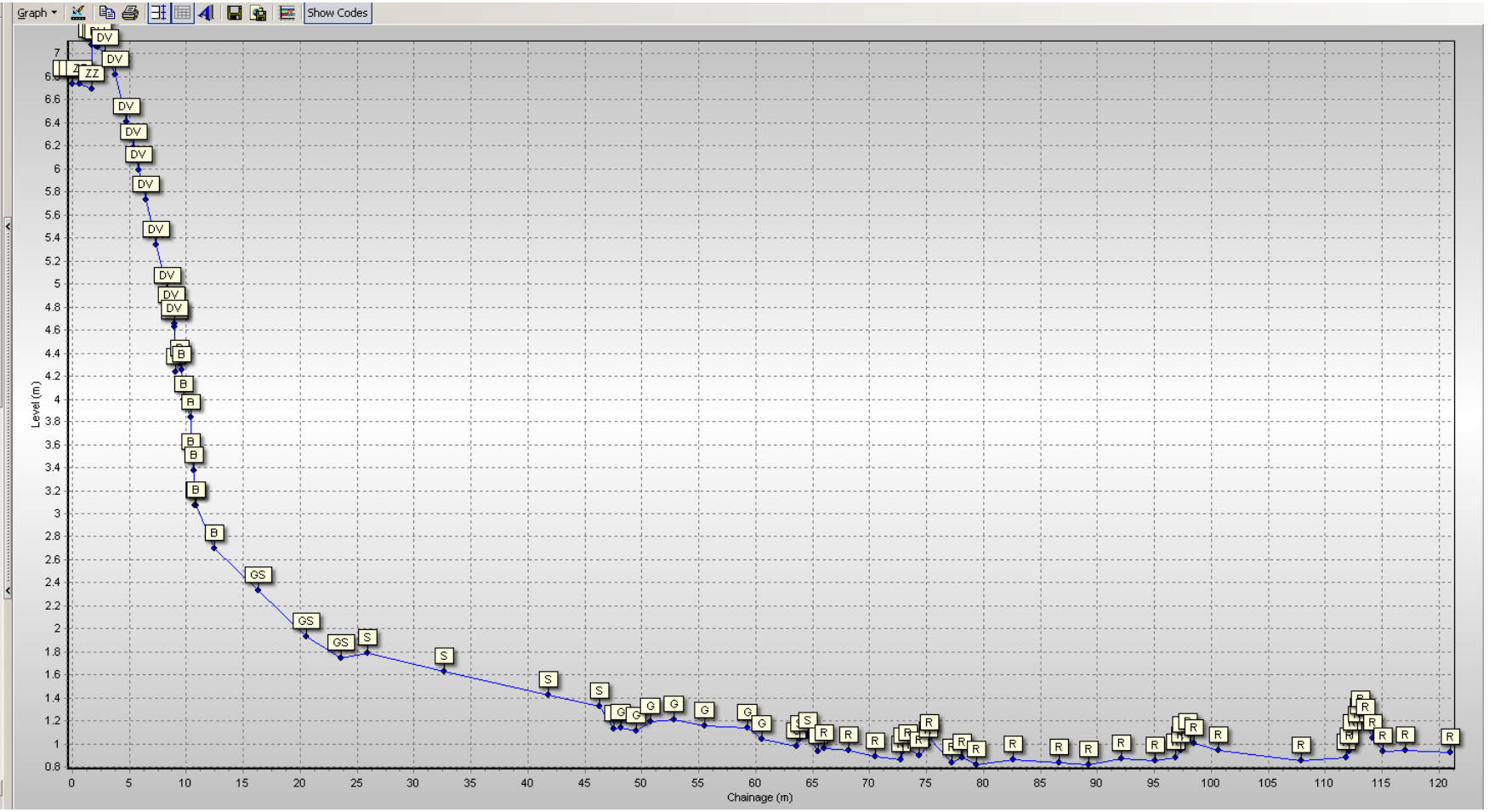
1aADC04A - 11/10/2010

Chainage	Level	Code
0.000	5.372	
0.631	5.372	G
1.198	5.367	G
1.911	5.314	G
3.252	5.174	G
4.919	5.111	G
7.651	4.990	G
9.269	4.898	G
10.469	4.958	G
11.582	4.824	M
11.733	4.739	M
13.223	4.144	M
13.448	3.744	M
13.695	3.493	M
14.734	3.284	B
15.954	3.119	S
18.598	2.856	S
19.619	2.751	GS
21.942	2.580	GS
22.690	2.628	GS
23.266	2.511	GS
25.413	2.267	GS
26.625	2.103	GS
29.438	1.956	S
33.730	1.716	S
37.053	1.406	S
38.534	1.293	G
42.790	1.113	G
44.208	1.062	G
47.687	1.008	G
50.316	1.013	G
50.488	1.035	R
50.807	1.106	R
50.972	1.111	R
51.463	1.057	R
51.499	1.102	R
51.871	1.129	R
52.632	1.111	R
53.367	1.037	R
53.424	1.068	R
53.780	1.111	R
55.546	1.080	R



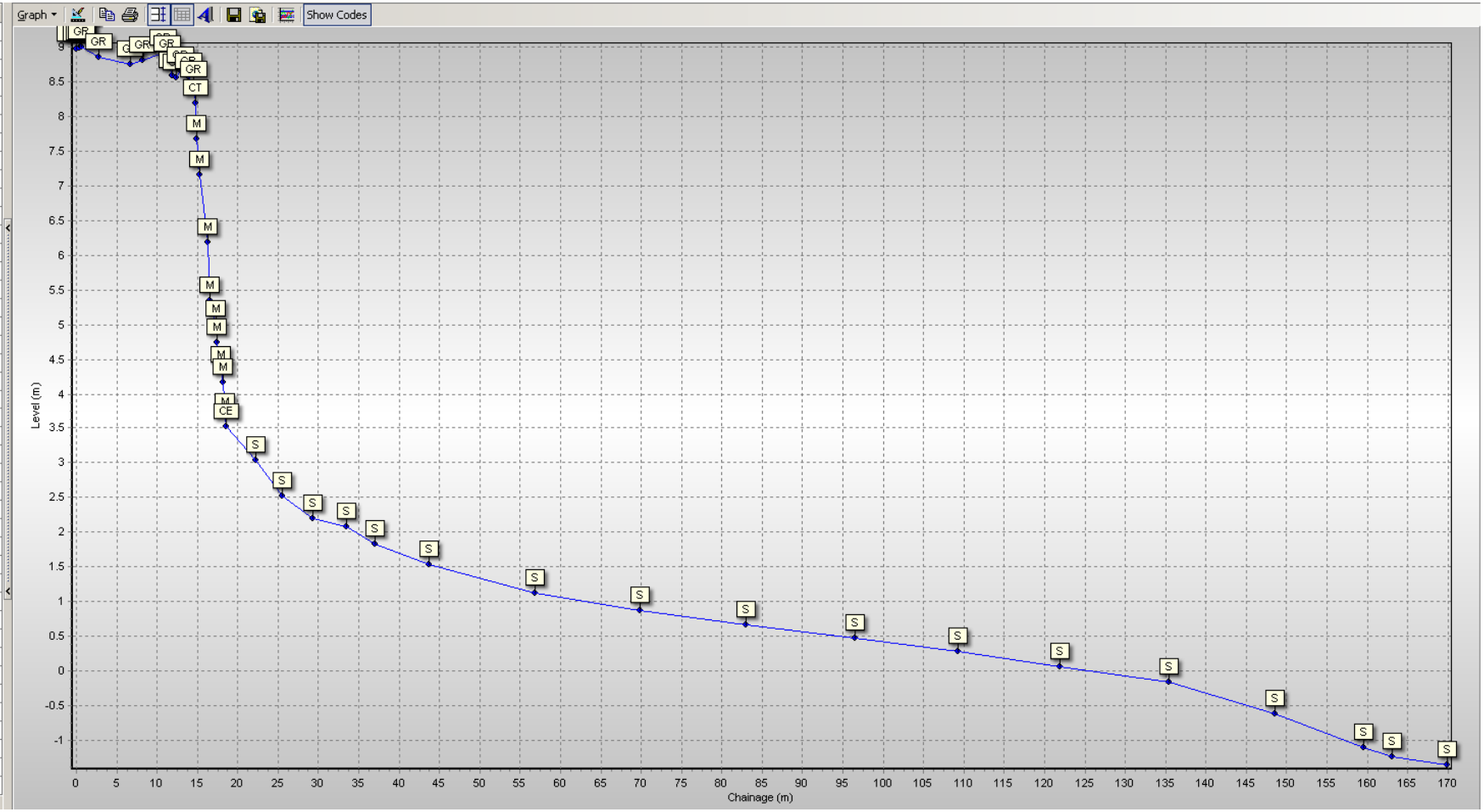
1aADC04B - 11/10/2010

Chainage	Level	Code
0.000	6.735	
0.011	6.735	ZZ
0.612	6.741	ZZ
1.660	6.693	ZZ
1.728	7.075	ZZ
2.075	7.067	ZZ
2.265	7.059	DV
2.826	7.005	DV
3.756	6.813	DV
4.767	6.408	DV
5.412	6.185	DV
5.813	5.990	DV
6.491	5.731	DV
7.313	5.339	DV
8.330	4.936	DV
8.702	4.770	DV
8.975	4.629	DV
9.002	4.658	DV
9.044	4.239	B
9.445	4.310	B
9.593	4.257	B
9.797	3.995	B
10.363	3.837	B
10.375	3.486	B
10.701	3.376	B
10.730	3.075	B
10.889	3.069	B
12.449	2.697	B
16.337	2.333	GS
20.546	1.932	GS
23.561	1.744	GS
25.935	1.787	S
32.604	1.631	S
41.836	1.421	S
46.248	1.331	S
47.534	1.135	S
48.148	1.138	G
49.496	1.110	G
50.806	1.192	G
52.853	1.209	G
55.484	1.157	G
59.257	1.141	G



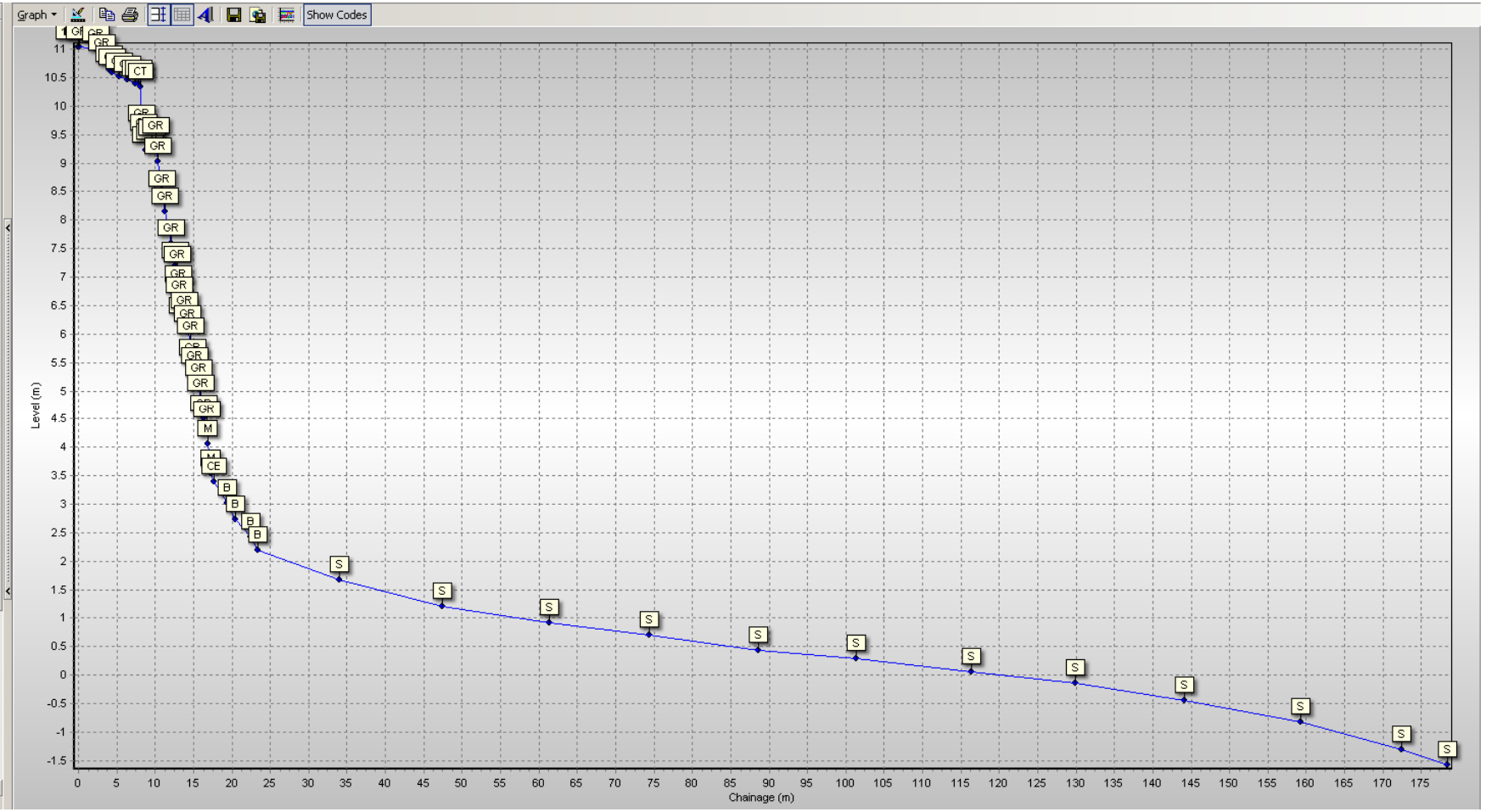
1aADC05 - 21/09/2010

Chainage	Level	Code
0.000	8.961	
0.041	8.961	GR
0.364	8.987	GR
0.586	8.996	GR
2.784	8.842	GR
6.681	8.744	GR
8.235	8.811	GR
10.786	8.903	GR
11.304	8.820	GR
11.916	8.585	GR
12.387	8.553	GR
12.829	8.657	GR
13.855	8.565	GR
14.481	8.455	GR
14.792	8.194	CT
14.940	7.673	M
15.253	7.151	M
16.281	6.192	M
16.607	5.350	M
17.293	5.008	M
17.432	4.739	M
17.978	4.348	M
18.235	4.167	M
18.453	3.675	M
18.563	3.522	CE
22.176	3.043	S
25.523	2.514	S
29.286	2.197	S
33.441	2.074	S
37.065	1.832	S
43.668	1.541	S
56.896	1.121	S
69.897	0.871	S
82.965	0.671	S
96.543	0.472	S
109.243	0.279	S
121.923	0.070	S
135.380	-0.151	S
148.572	-0.607	S
159.507	-1.106	S
163.070	-1.229	S
169.901	-1.349	S



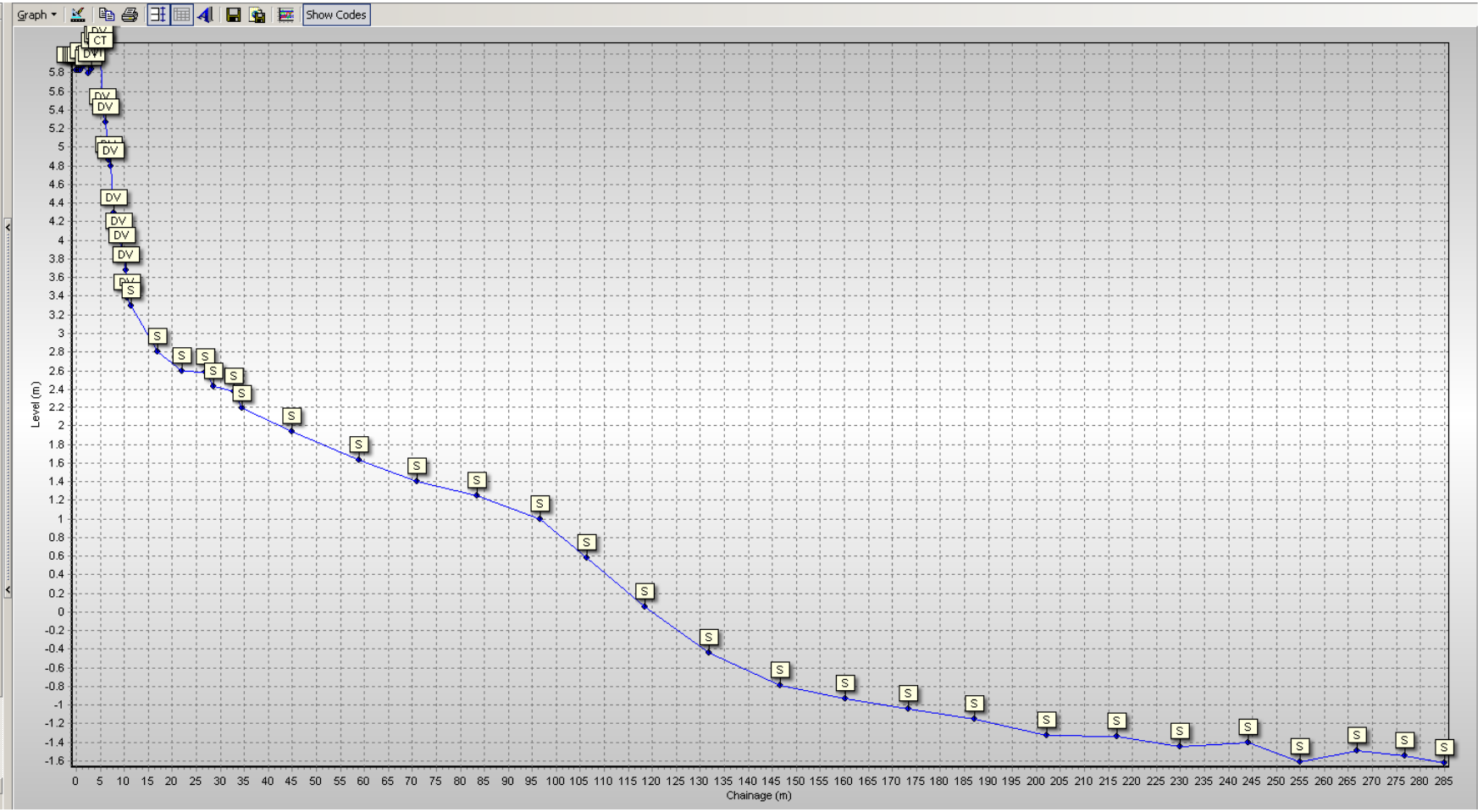
1aADC06 - 21/09/2010

Chainage	Level	Code
0.000	11.039	
0.100	11.039	GR
2.223	10.999	GR
3.034	10.836	GR
4.044	10.649	GR
4.414	10.584	GR
5.251	10.520	GR
6.392	10.463	GR
7.382	10.400	GR
7.890	10.399	GR
8.071	10.336	CT
8.297	9.611	GR
8.513	9.447	GR
8.818	9.233	GR
9.237	9.273	GR
9.528	9.358	GR
10.161	9.393	GR
10.364	9.023	GR
10.917	8.453	GR
11.242	8.147	GR
12.154	7.585	GR
12.626	7.197	GR
12.918	7.123	GR
12.990	6.790	GR
13.180	6.586	GR
13.594	6.232	GR
13.757	6.324	GR
14.153	6.095	GR
14.667	5.869	GR
14.891	5.496	GR
15.192	5.350	GR
15.623	5.137	GR
15.904	4.872	GR
16.334	4.509	GR
16.758	4.404	GR
16.854	4.061	M
17.323	3.535	M
17.682	3.390	CE
19.345	3.012	B
20.452	2.727	B
22.480	2.431	B
23.439	2.194	B



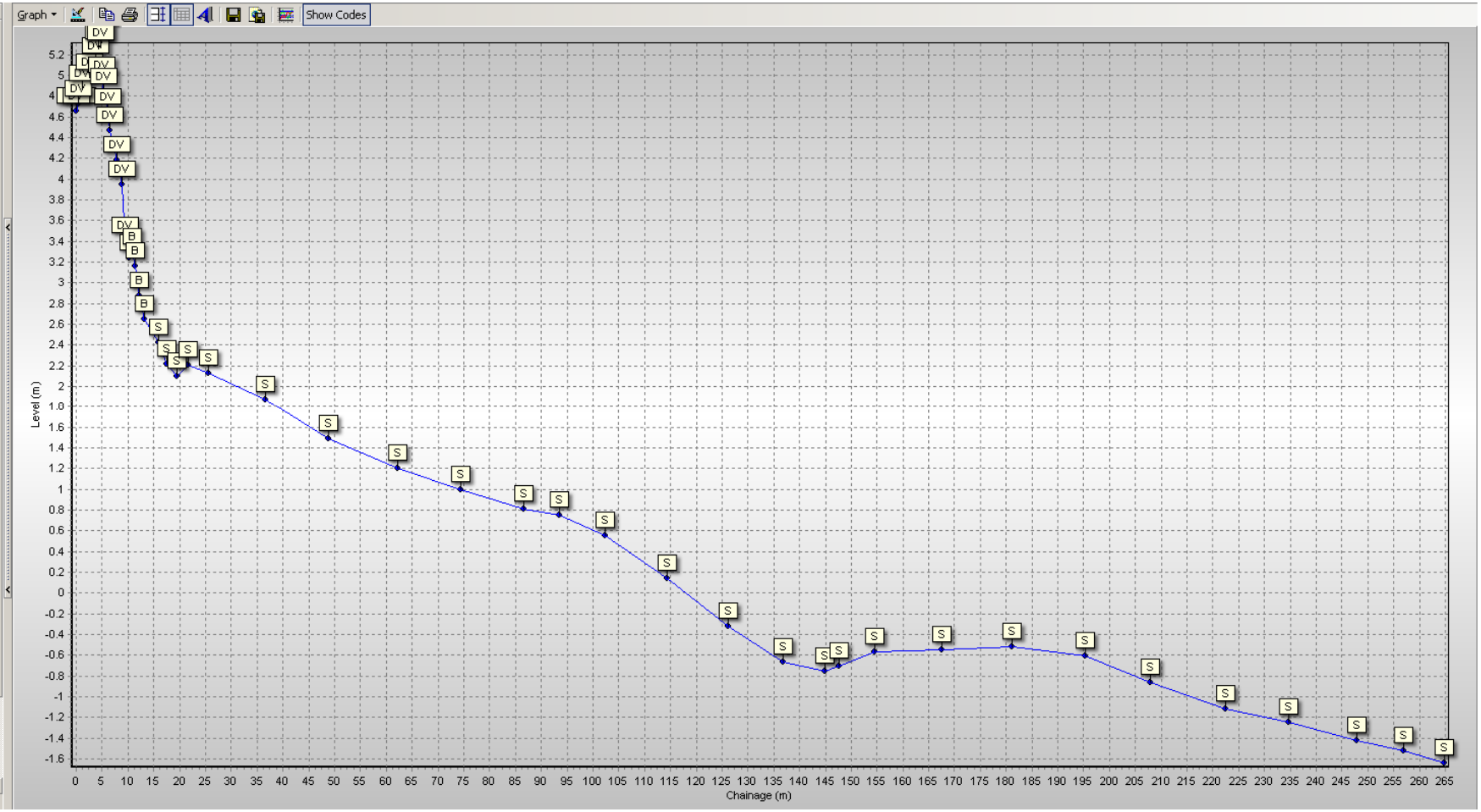
1aADC07 - 21/09/2010

Chainage	Level	Code
0.000	5.832	
0.046	5.832	DV
0.344	5.823	DV
0.820	5.823	DV
1.451	5.866	DV
2.458	5.794	DV
3.165	5.840	DV
3.737	5.975	DV
4.445	6.047	DV
4.880	6.079	DV
5.147	5.979	CT
5.533	5.383	DV
6.061	5.271	DV
6.686	4.866	DV
7.141	4.802	DV
7.847	4.296	DV
8.802	4.040	DV
9.589	3.888	DV
10.300	3.677	DV
10.546	3.381	DV
11.530	3.291	S
16.880	2.803	S
22.131	2.598	S
26.815	2.589	S
28.533	2.434	S
32.848	2.372	S
34.541	2.193	S
44.936	1.938	S
58.893	1.635	S
70.921	1.402	S
83.571	1.245	S
96.567	1.000	S
106.362	0.578	S
118.413	0.047	S
131.809	-0.442	S
146.725	-0.795	S
160.250	-0.938	S
173.445	-1.041	S
187.157	-1.148	S
202.102	-1.333	S
216.819	-1.339	S
229.895	-1.450	S



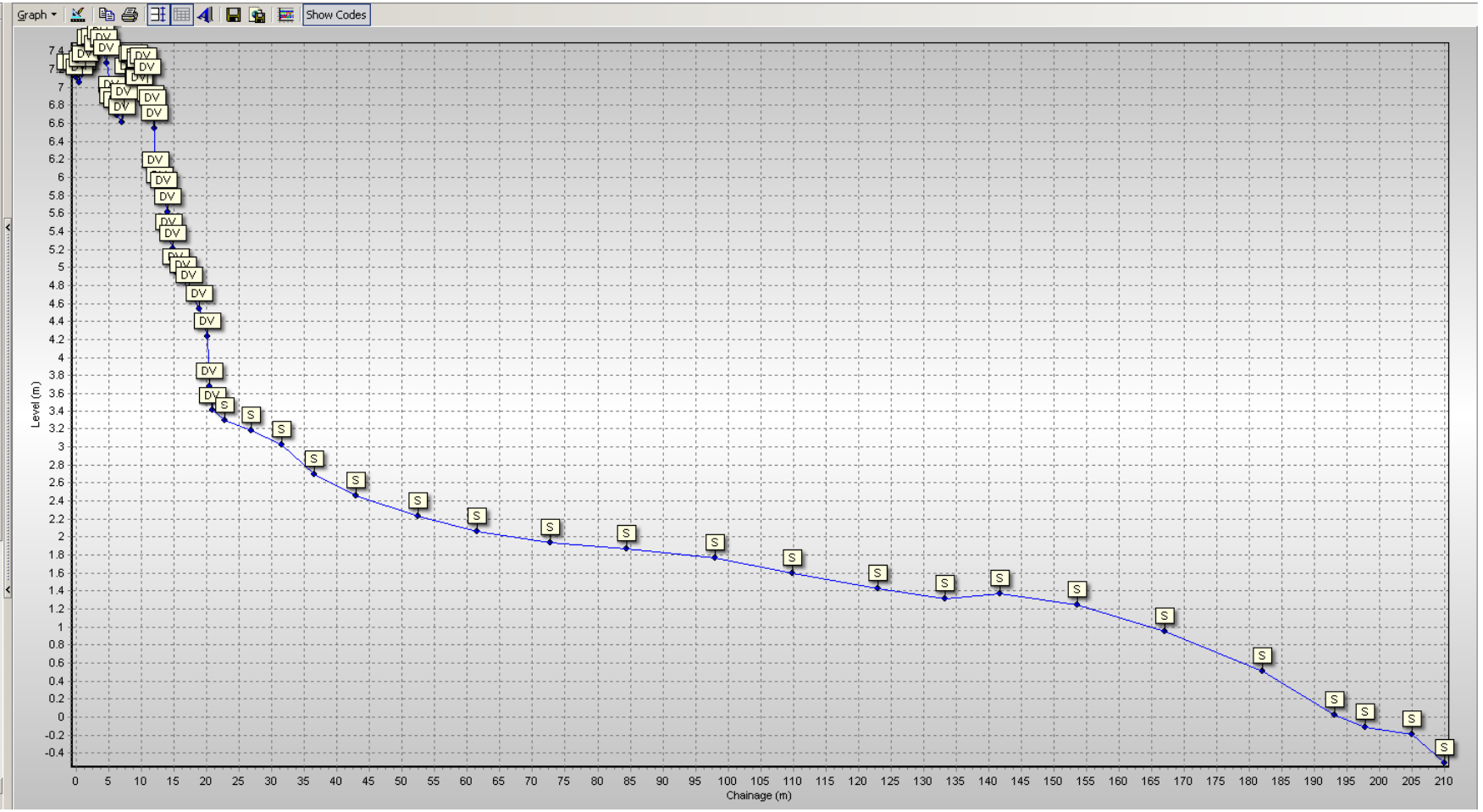
1aADC08 - 21/09/2010

Chainage	Level	Code
0.000	4.655	
0.028	4.655	DV
0.459	4.724	DV
1.140	4.875	DV
2.651	4.979	DV
3.833	5.142	DV
4.406	5.275	DV
4.678	5.265	DV
4.961	4.954	DV
5.246	4.838	DV
6.114	4.646	DV
6.513	4.472	DV
7.915	4.181	DV
8.814	3.942	DV
9.446	3.405	DV
10.249	3.241	B
10.789	3.302	B
11.434	3.158	B
12.263	2.871	B
13.277	2.650	B
16.001	2.425	S
17.453	2.217	S
19.504	2.097	S
21.728	2.209	S
25.539	2.124	S
36.694	1.872	S
48.822	1.490	S
62.193	1.202	S
74.352	0.996	S
86.615	0.806	S
93.434	0.752	S
102.326	0.549	S
114.410	0.138	S
126.253	-0.327	S
136.916	-0.664	S
144.915	-0.751	S
147.564	-0.703	S
154.496	-0.566	S
167.549	-0.546	S
181.166	-0.524	S
195.297	-0.605	S
207.874	-0.867	S



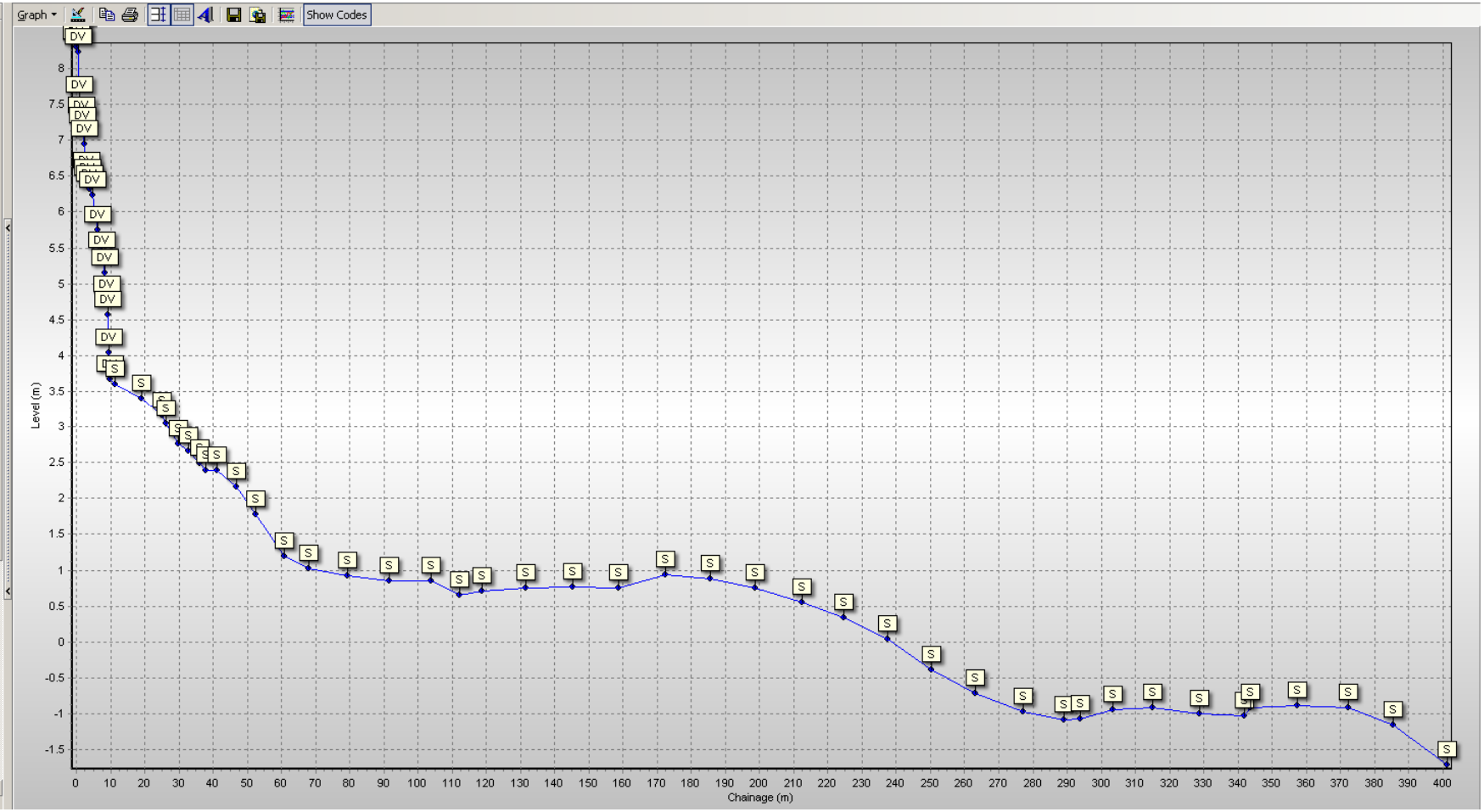
1aADC09 - 21/09/2010

Chainage	Level	Code
0.000	7.108	
0.048	7.108	DV
0.397	7.055	DV
0.943	7.139	DV
1.449	7.196	DV
2.209	7.376	DV
2.752	7.387	DV
3.220	7.308	DV
3.798	7.449	DV
4.176	7.386	DV
4.718	7.265	DV
5.416	6.866	DV
5.697	6.741	DV
6.299	6.686	DV
7.044	6.616	DV
7.312	6.782	DV
8.021	7.061	DV
8.533	7.199	DV
8.827	7.213	DV
9.466	6.956	DV
9.641	6.945	DV
9.877	7.133	DV
10.338	7.173	DV
10.923	7.048	DV
11.432	6.758	DV
11.736	6.711	DV
11.973	6.547	DV
12.233	6.020	DV
12.830	5.855	DV
13.369	5.798	DV
13.980	5.610	DV
14.252	5.333	DV
14.848	5.205	DV
15.312	4.946	DV
16.396	4.859	DV
17.306	4.744	DV
18.872	4.544	DV
20.134	4.232	DV
20.449	3.675	DV
20.972	3.403	DV
22.818	3.294	S
26.893	3.177	S



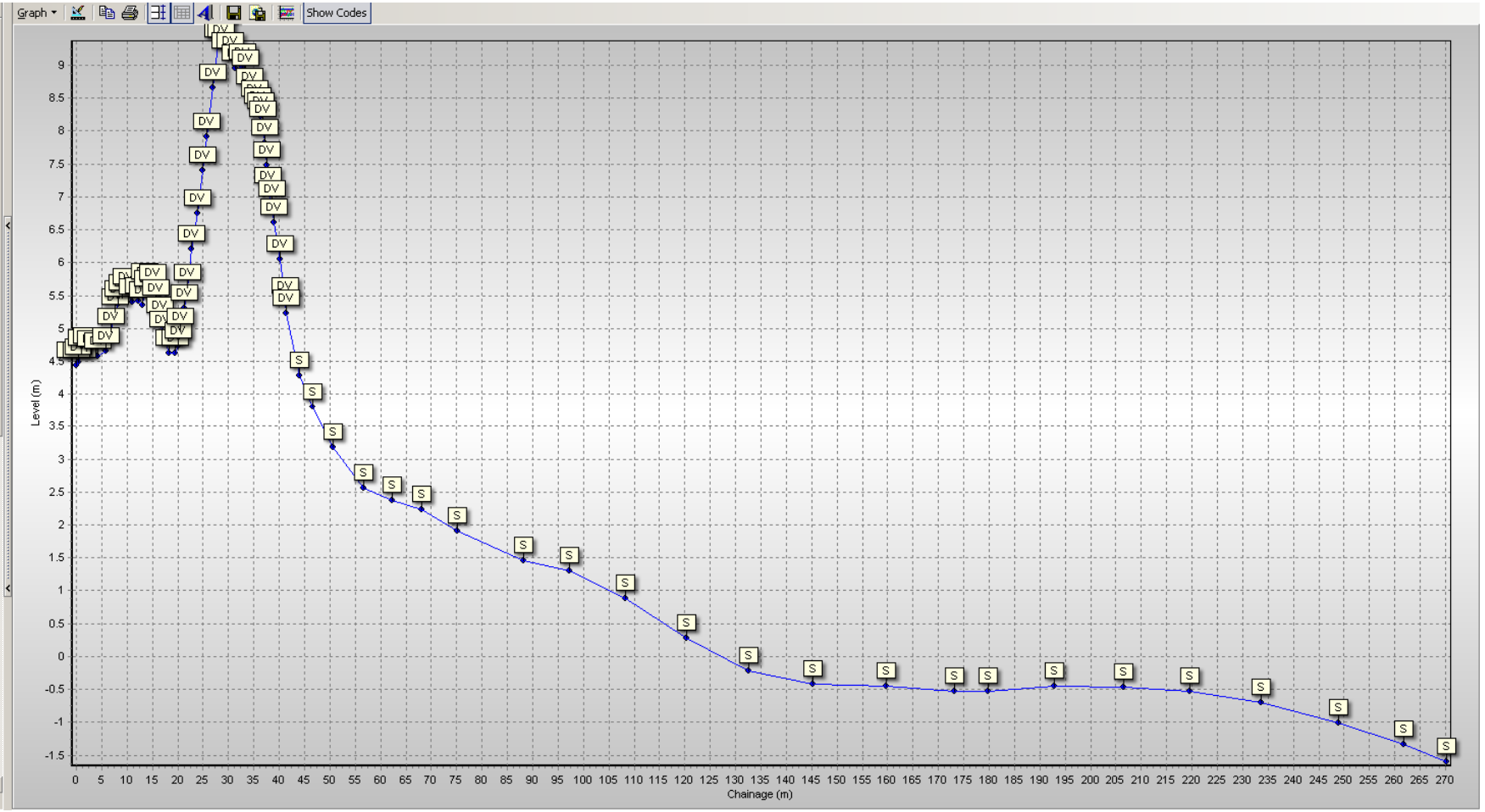
1aADC10 - 21/09/2010

Chainage	Level	Code
0.000	8.300	
0.036	8.300	DV
0.458	8.233	DV
0.965	7.560	DV
1.433	7.274	DV
1.890	7.138	DV
2.426	6.949	DV
3.005	6.502	DV
3.309	6.405	DV
3.866	6.325	DV
4.667	6.236	DV
6.156	5.756	DV
7.344	5.396	DV
8.212	5.155	DV
8.816	4.784	DV
9.213	4.575	DV
9.418	4.040	DV
9.749	3.664	DV
11.460	3.598	S
18.980	3.399	S
25.105	3.156	S
26.298	3.042	S
29.851	2.765	S
32.966	2.663	S
35.954	2.491	S
37.784	2.383	S
41.271	2.390	S
46.970	2.160	S
52.527	1.776	S
60.927	1.194	S
67.978	1.022	S
79.390	0.924	S
91.726	0.848	S
103.912	0.851	S
112.191	0.658	S
118.854	0.707	S
131.714	0.744	S
145.244	0.766	S
158.616	0.754	S
172.376	0.933	S
185.564	0.873	S
198.791	0.744	S



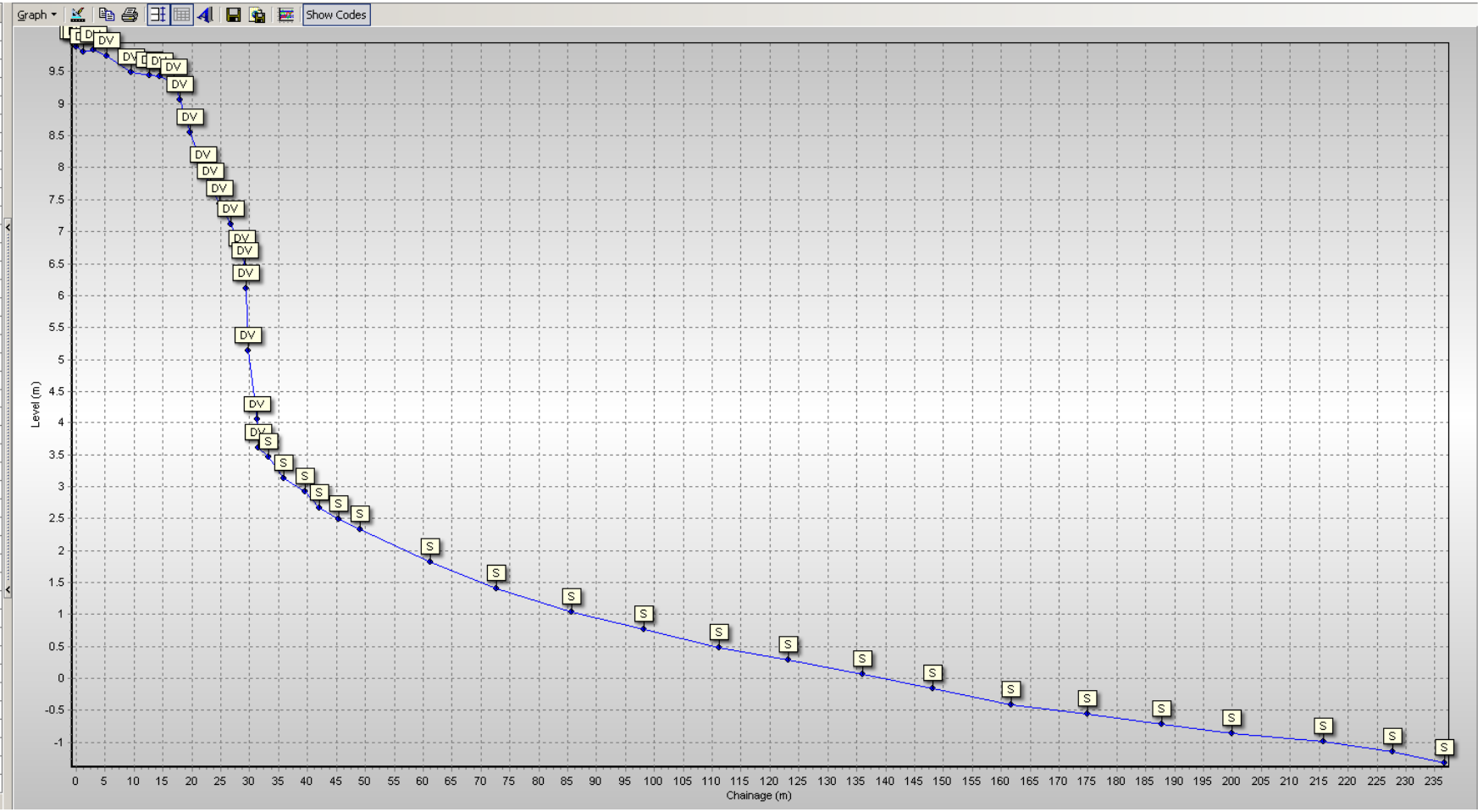
1aADC11 - 21/09/2010

Chainage	Level	Code
0.000	4.442	
0.037	4.442	DV
0.469	4.490	DV
1.037	4.631	DV
1.959	4.658	DV
2.880	4.602	DV
4.219	4.570	DV
5.822	4.662	DV
6.799	4.949	DV
7.583	5.251	DV
8.235	5.365	DV
8.978	5.462	DV
9.876	5.557	DV
11.057	5.407	DV
12.159	5.421	DV
13.015	5.360	DV
13.537	5.633	DV
14.104	5.522	DV
15.038	5.612	DV
15.595	5.392	DV
16.526	5.123	DV
17.088	4.905	DV
18.217	4.625	DV
19.412	4.617	DV
20.002	4.733	DV
20.578	4.949	DV
21.217	5.311	DV
21.831	5.610	DV
22.731	6.207	DV
23.808	6.754	DV
24.831	7.397	DV
25.669	7.917	DV
26.856	8.653	DV
27.987	9.311	DV
28.571	9.304	DV
29.281	9.147	DV
30.257	9.143	DV
31.340	8.952	DV
32.723	8.963	DV
33.445	8.870	DV
34.155	8.596	DV
35.142	8.404	DV



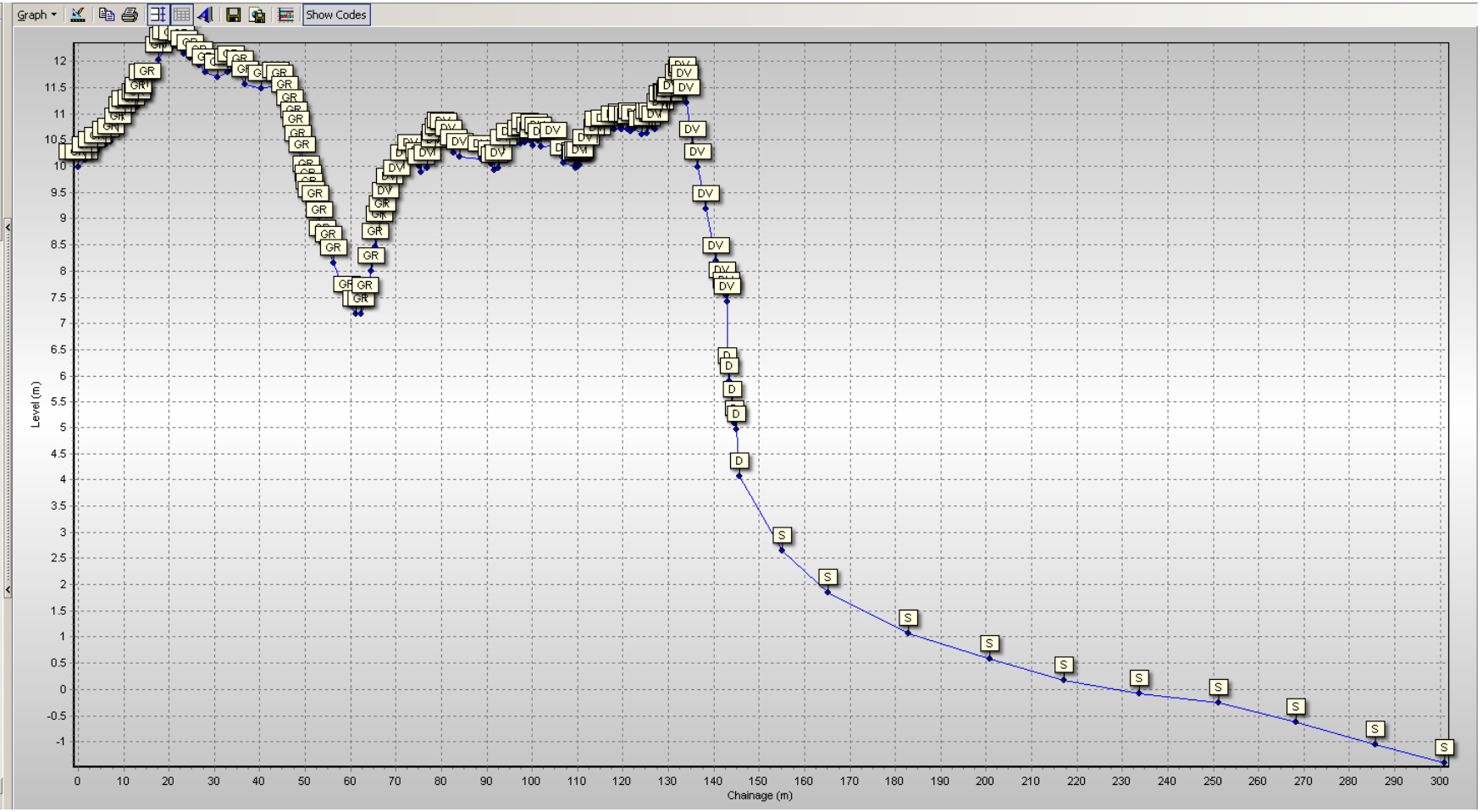
1aADC12 - 27/09/2010

Chainage	Level	Code
0.000	9.890	
0.014	9.890	DV
1.260	9.812	DV
2.932	9.844	DV
5.323	9.749	DV
9.442	9.496	DV
12.627	9.439	DV
14.376	9.433	DV
16.887	9.334	DV
17.916	9.056	DV
19.660	8.553	DV
21.942	7.967	DV
23.267	7.710	DV
24.889	7.435	DV
26.748	7.121	DV
28.660	6.649	DV
29.194	6.461	DV
29.441	6.117	DV
29.729	5.136	DV
31.304	4.051	DV
31.479	3.604	DV
33.336	3.460	S
35.985	3.133	S
39.527	2.915	S
42.059	2.657	S
45.359	2.492	S
49.055	2.325	S
61.205	1.812	S
72.748	1.404	S
85.718	1.040	S
98.151	0.762	S
111.148	0.486	S
123.225	0.287	S
136.084	0.062	S
148.159	-0.158	S
161.669	-0.407	S
174.897	-0.553	S
187.697	-0.715	S
199.942	-0.860	S
215.838	-0.989	S
227.806	-1.142	S
236.701	-1.324	S



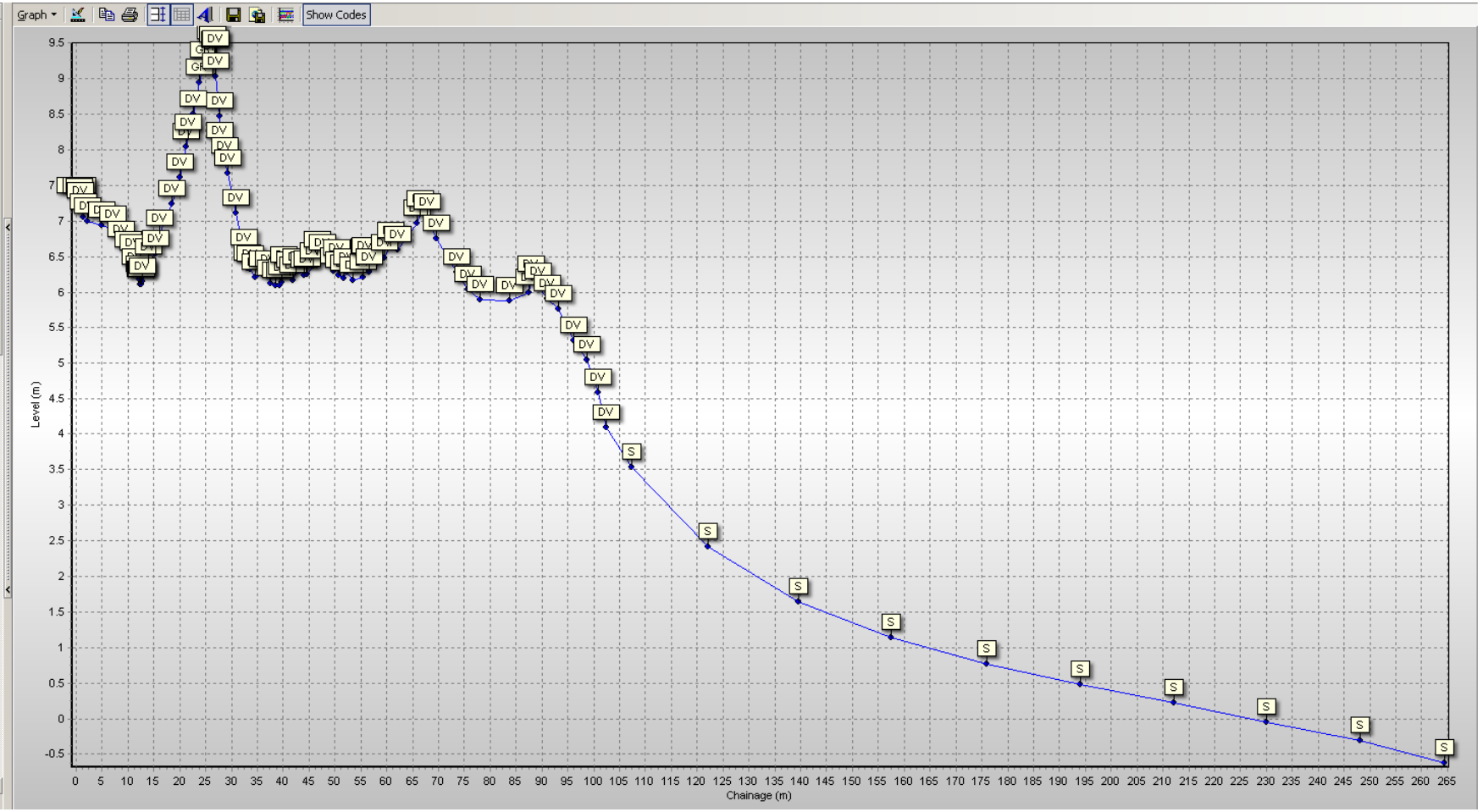
1aADC13 - 27/09/2010

Chainage	Level	Code
0.000	9.982	
0.049	9.982	GR
1.519	10.122	GR
2.823	10.218	GR
4.204	10.300	GR
6.011	10.411	GR
7.214	10.464	GR
8.715	10.669	GR
9.598	10.882	GR
10.343	11.000	GR
11.748	11.020	GR
12.477	11.121	GR
12.911	11.135	GR
13.220	11.239	GR
14.045	11.490	GR
15.204	11.510	GR
17.794	12.024	GR
18.583	12.198	GR
19.194	12.278	GR
20.566	12.266	GR
22.708	12.247	GR
23.404	12.137	GR
24.605	12.063	GR
26.585	11.928	GR
28.075	11.784	GR
30.785	11.694	GR
32.865	11.787	GR
33.577	11.855	GR
35.672	11.760	GR
36.653	11.559	GR
40.434	11.488	GR
43.394	11.547	GR
44.325	11.482	GR
45.515	11.260	GR
46.629	11.013	GR
47.549	10.787	GR
47.903	10.595	GR
48.493	10.326	GR
49.290	10.125	GR
50.215	9.757	GR
50.534	9.577	GR
50.825	9.409	GR



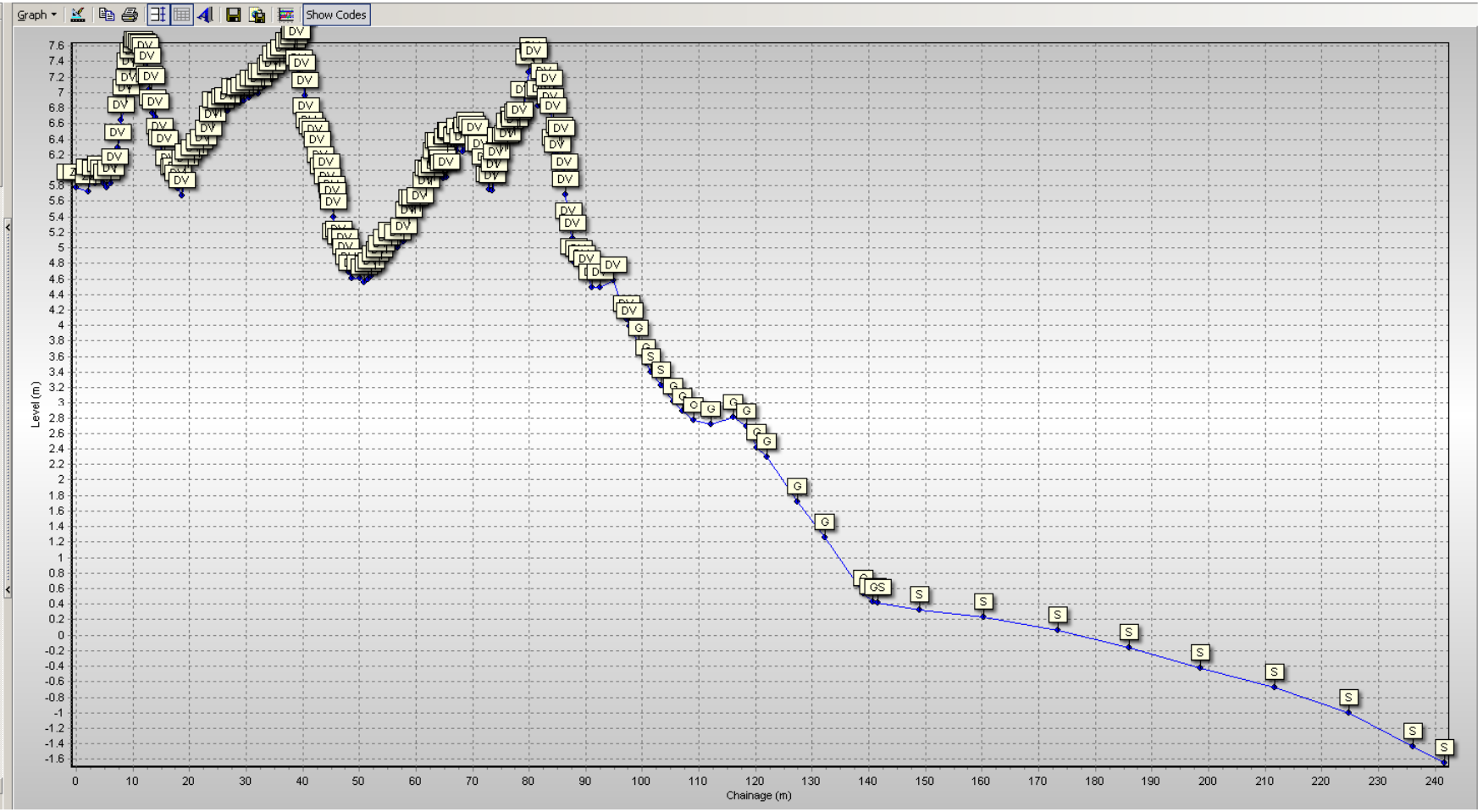
1aADC14 - 27/09/2010

Chainage	Level	Code
0.000	7.275	
0.036	7.275	DV
0.503	7.270	DV
0.735	7.211	DV
1.433	7.047	DV
2.199	7.000	DV
4.831	6.936	DV
7.102	6.877	DV
8.607	6.672	DV
9.950	6.525	DV
11.035	6.473	DV
11.323	6.281	DV
12.144	6.186	DV
12.304	6.112	DV
12.639	6.107	DV
12.746	6.150	DV
13.877	6.417	DV
15.282	6.537	DV
16.164	6.823	DV
18.465	7.236	DV
20.038	7.614	DV
21.331	8.040	DV
21.550	8.175	DV
22.580	8.495	DV
23.879	8.943	GR
24.501	9.181	GR
26.004	9.444	GR
26.355	9.400	GR
26.693	9.329	DV
26.891	9.349	DV
27.009	9.035	DV
27.626	8.467	DV
27.801	8.060	DV
28.775	7.847	DV
29.307	7.663	DV
30.881	7.111	DV
32.349	6.548	DV
32.982	6.336	DV
33.689	6.329	DV
34.633	6.204	DV
35.998	6.249	DV
37.209	6.248	DV



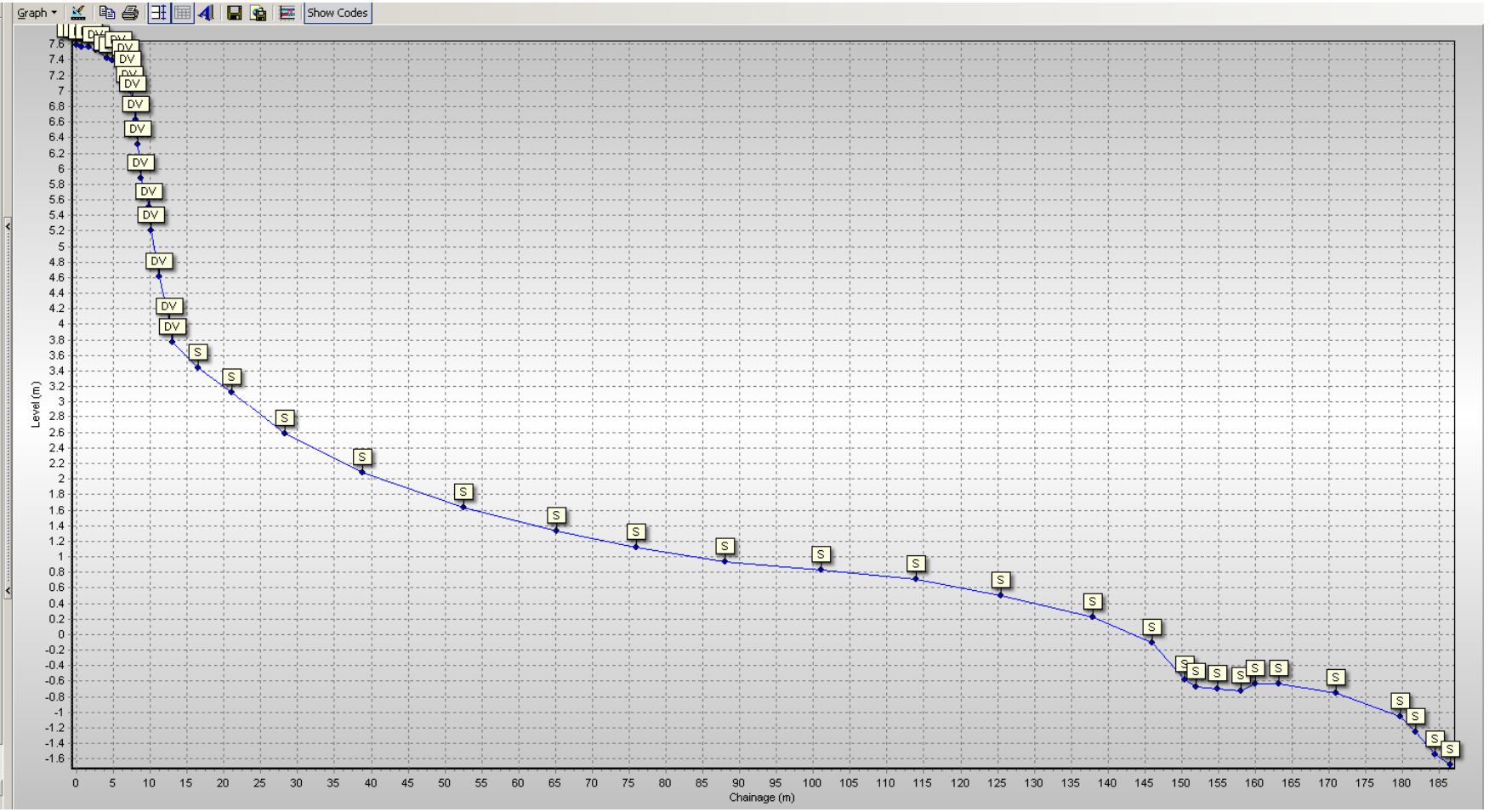
1aADC15 - 06/10/2010

Chainage	Level	Code
0.000	5.776	
0.030	5.776	ZZ
2.232	5.730	ZZ
2.368	5.839	DV
3.379	5.828	DV
4.387	5.883	DV
4.822	5.834	DV
5.450	5.778	DV
6.150	5.824	DV
6.866	5.968	DV
7.426	6.295	DV
7.987	6.645	DV
8.783	6.864	DV
9.280	6.999	DV
9.533	7.206	DV
10.082	7.334	DV
10.628	7.414	DV
10.703	7.488	DV
11.226	7.487	DV
11.445	7.454	DV
11.786	7.447	DV
12.132	7.410	DV
12.606	7.278	DV
12.892	7.039	DV
13.286	7.007	DV
13.400	6.730	DV
14.033	6.686	DV
14.816	6.367	DV
15.063	6.226	DV
15.690	6.205	DV
16.295	5.959	DV
17.304	5.848	DV
17.569	5.854	DV
17.935	5.761	DV
18.607	5.671	DV
19.195	5.955	DV
19.763	6.042	DV
20.771	6.088	DV
21.663	6.173	DV
22.531	6.224	DV
23.366	6.339	DV
24.078	6.529	DV



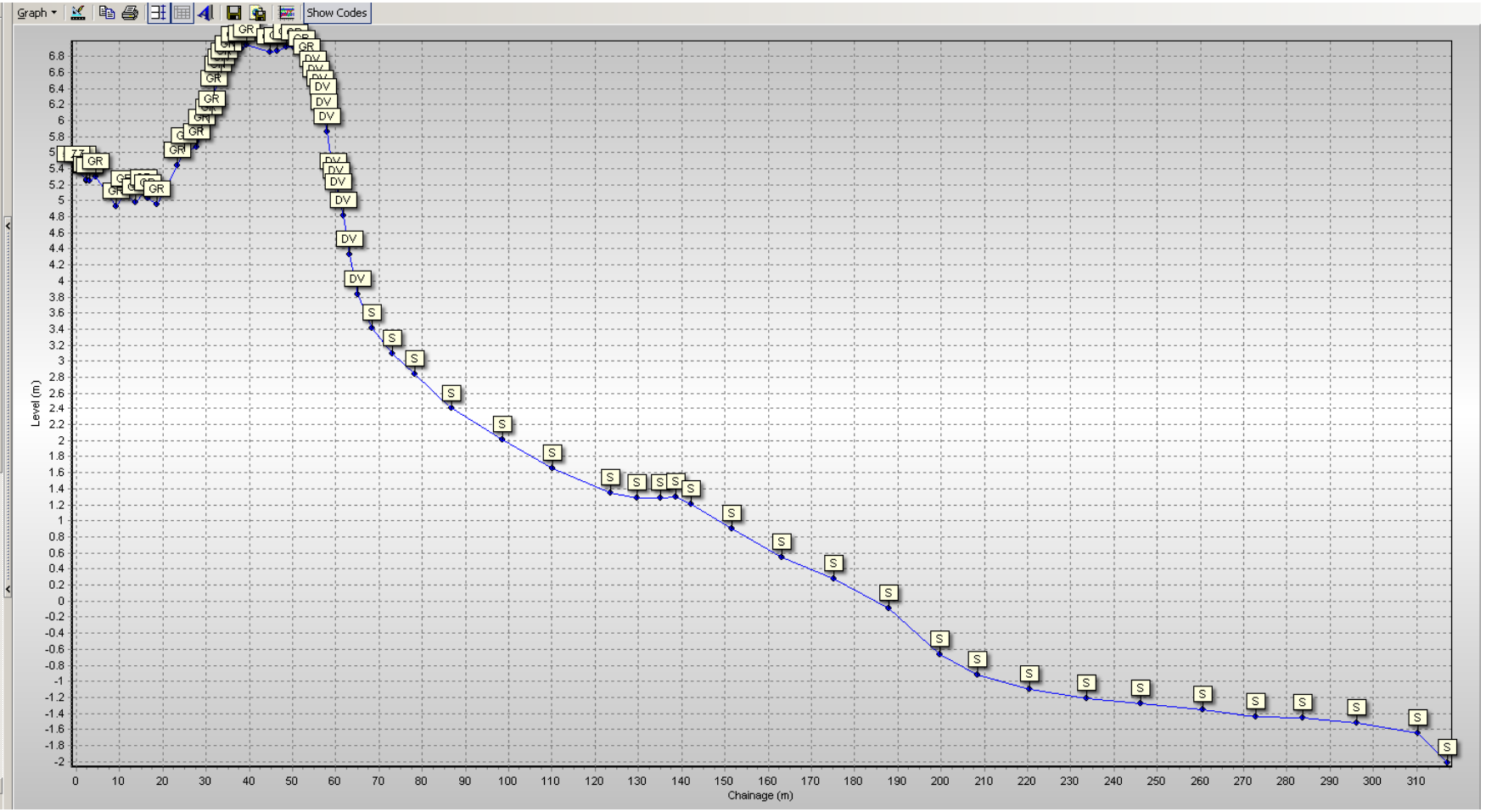
1aADC15A - 06/10/2010

Chainage	Level	Code
0.000	7.591	
0.068	7.591	DV
0.625	7.569	DV
1.620	7.564	DV
2.679	7.525	DV
4.211	7.425	DV
4.886	7.393	DV
5.734	7.463	DV
6.650	7.357	DV
6.950	7.206	DV
7.275	7.013	DV
7.676	6.889	DV
7.992	6.630	DV
8.297	6.318	DV
8.794	5.872	DV
9.804	5.513	DV
10.161	5.204	DV
11.237	4.612	DV
12.660	4.038	DV
13.013	3.763	DV
16.461	3.444	S
21.114	3.121	S
28.299	2.582	S
38.777	2.077	S
52.515	1.638	S
65.177	1.324	S
75.930	1.121	S
88.009	0.933	S
101.064	0.826	S
113.975	0.708	S
125.541	0.499	S
137.928	0.217	S
145.927	-0.100	S
150.424	-0.584	S
151.943	-0.672	S
154.918	-0.704	S
158.110	-0.725	S
159.974	-0.633	S
163.152	-0.634	S
170.940	-0.747	S
179.641	-1.051	S
181.764	-1.247	S



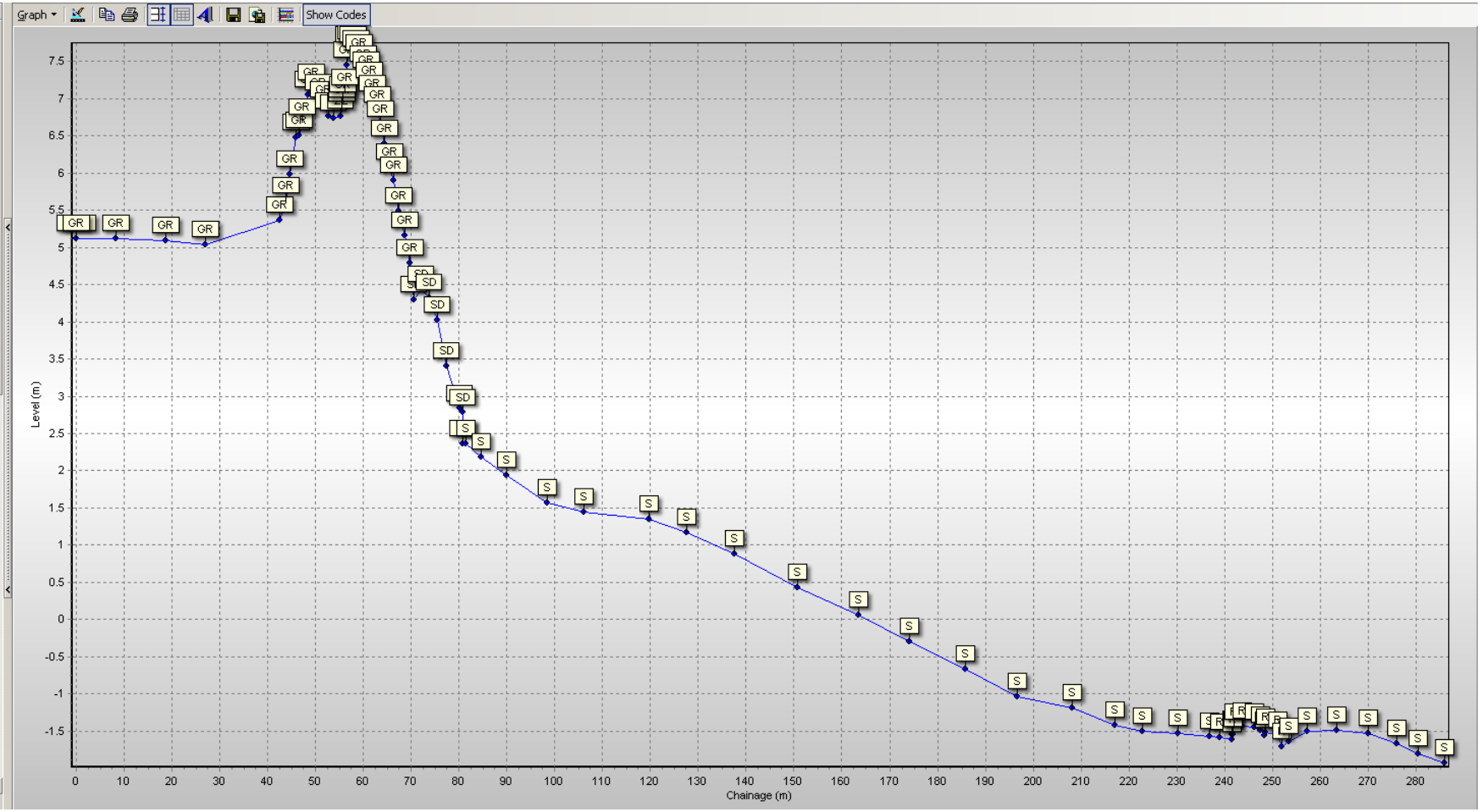
1aADC16 - 06/10/2010

Chainage	Level	Code
0.000	5.389	
0.133	5.389	ZZ
2.274	5.242	ZZ
2.431	5.254	GR
3.137	5.246	GR
4.574	5.300	GR
9.105	4.929	GR
11.101	5.082	GR
13.610	4.974	GR
15.589	5.089	GR
16.622	5.031	GR
18.645	4.950	GR
23.366	5.441	GR
25.017	5.612	GR
27.777	5.670	GR
29.078	5.845	GR
30.689	5.977	GR
31.263	6.074	GR
31.836	6.328	GR
32.728	6.510	GR
33.535	6.597	GR
34.213	6.670	GR
35.104	6.764	GR
36.663	6.884	GR
38.266	6.888	GR
39.406	6.942	GR
44.818	6.851	GR
46.385	6.868	GR
48.583	6.921	GR
50.417	6.899	GR
52.007	6.827	GR
53.258	6.731	GR
54.689	6.578	DV
55.456	6.440	DV
56.432	6.334	DV
57.037	6.229	DV
57.356	6.036	DV
58.065	5.865	DV
59.365	5.302	DV
60.129	5.181	DV
60.608	5.039	DV
61.814	4.813	DV



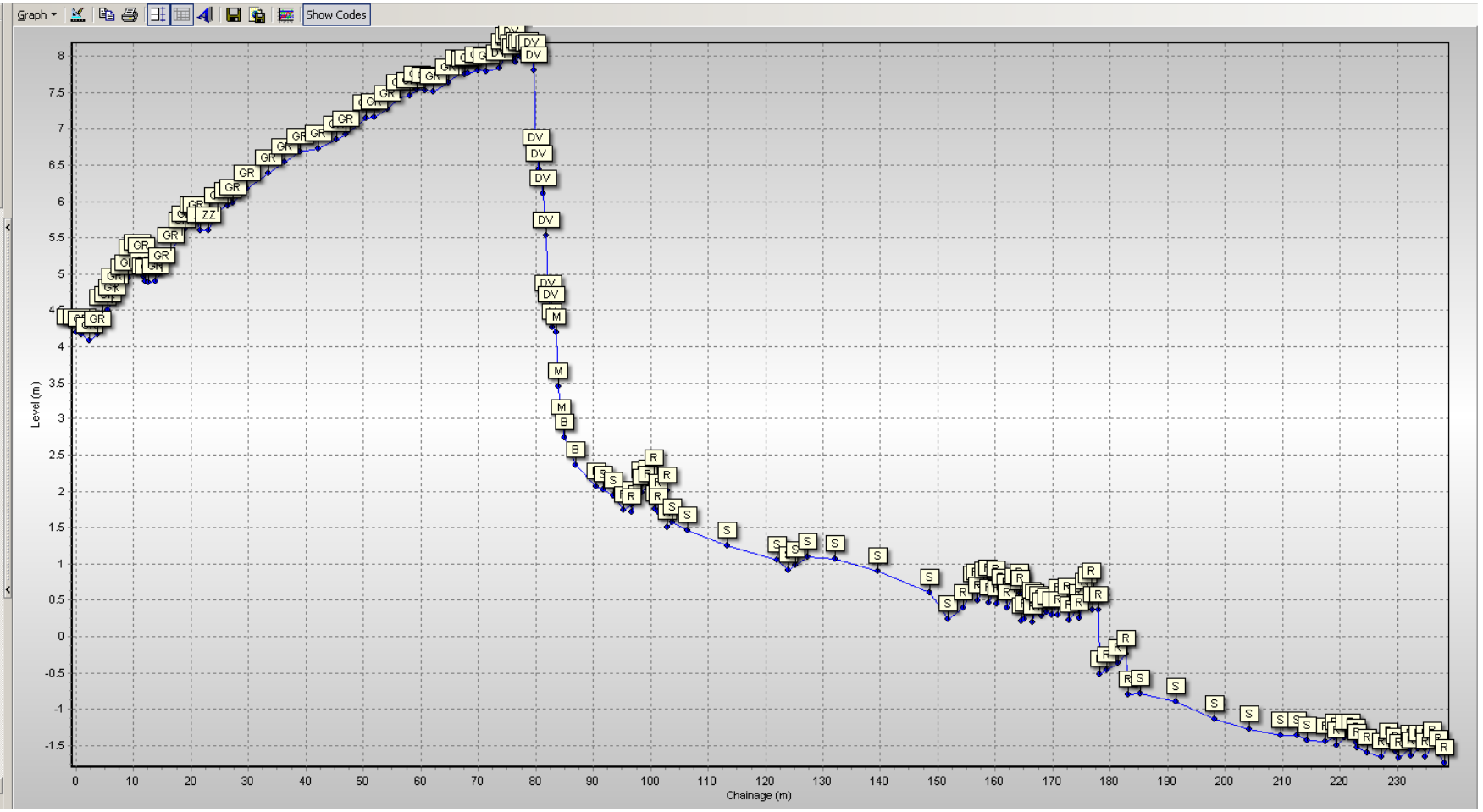
1aADC16A - 06/10/2010

Chainage	Level	Code
0.000	5.122	
0.057	5.122	GR
8.397	5.119	GR
18.635	5.095	GR
26.951	5.038	GR
42.446	5.363	GR
43.804	5.630	GR
44.605	5.985	GR
45.980	6.470	GR
46.663	6.499	GR
47.126	6.685	GR
48.385	7.046	GR
49.121	7.153	GR
50.552	7.015	GR
51.688	6.921	GR
52.726	6.762	ZZ
53.858	6.735	ZZ
55.203	6.767	ZZ
55.407	6.864	GR
55.557	6.912	GR
55.693	6.990	GR
56.044	7.076	GR
56.455	7.447	GR
57.038	7.648	GR
57.353	7.695	GR
57.848	7.658	GR
58.449	7.597	GR
59.202	7.538	GR
59.900	7.395	GR
60.690	7.308	GR
61.318	7.171	GR
61.891	6.992	GR
62.880	6.849	GR
63.612	6.659	GR
64.495	6.397	GR
65.580	6.075	GR
66.281	5.900	GR
67.424	5.491	GR
68.581	5.169	GR
69.685	4.795	GR
70.699	4.304	SD
72.115	4.440	SD



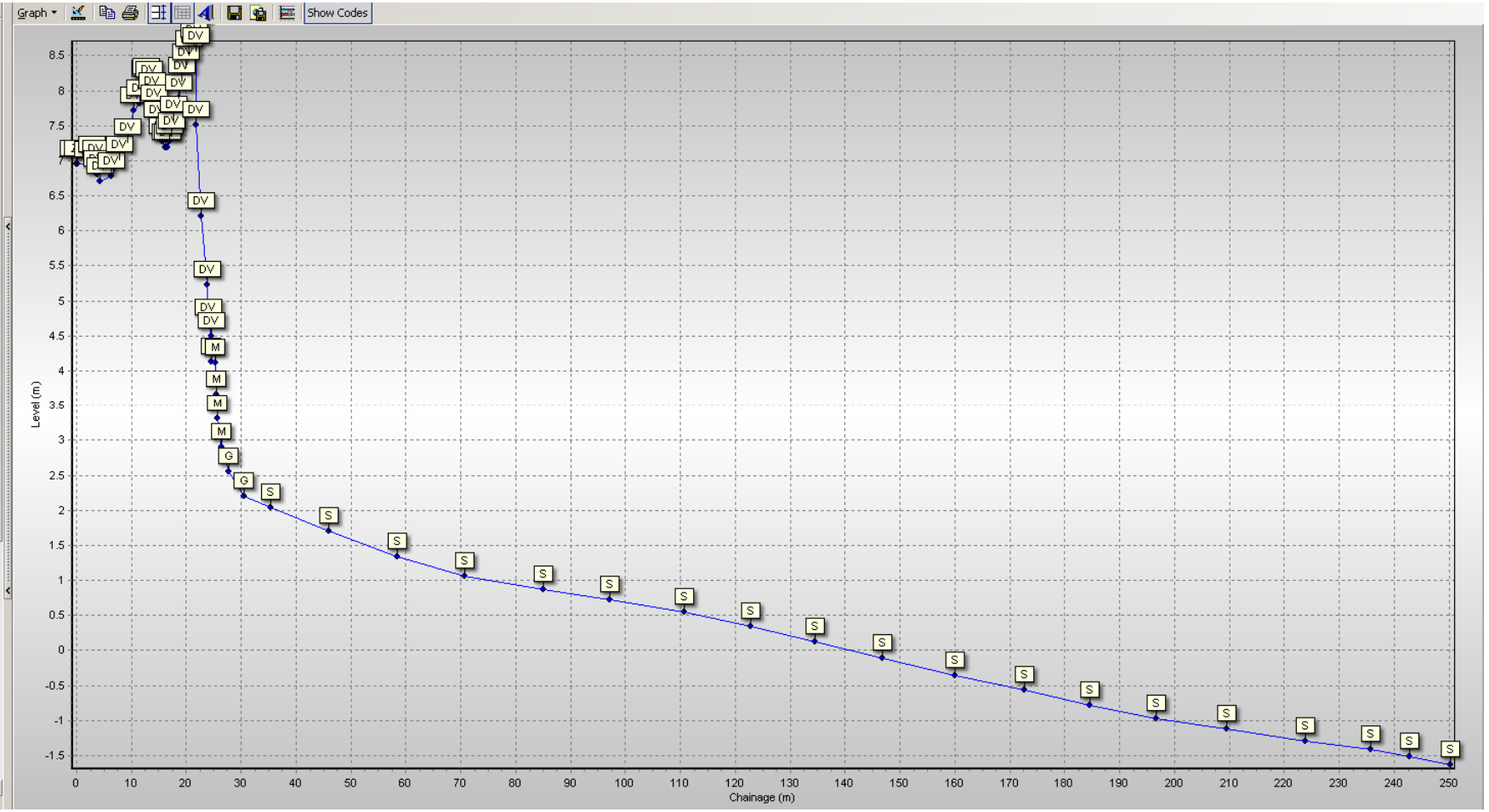
1aADC16B - 06/10/2010

Chainage	Level	Code
0.000	4.197	
0.049	4.197	GR
0.954	4.168	GR
2.308	4.091	GR
3.800	4.163	GR
4.521	4.457	GR
5.425	4.507	GR
6.224	4.600	GR
6.738	4.752	GR
8.279	4.878	GR
9.067	4.940	GR
9.813	5.154	GR
10.588	5.225	GR
11.297	5.174	GR
11.712	4.970	GR
12.120	4.894	GR
12.625	4.889	GR
13.811	4.905	GR
14.817	5.045	GR
16.505	5.314	GR
18.358	5.528	GR
18.928	5.611	GR
20.341	5.746	GR
20.823	5.747	GR
21.688	5.605	ZZ
23.084	5.595	ZZ
24.675	5.868	GR
26.438	5.939	GR
27.246	5.975	GR
29.813	6.171	GR
33.433	6.388	GR
36.290	6.546	GR
38.961	6.681	GR
42.134	6.722	GR
45.300	6.851	GR
46.966	6.922	GR
50.515	7.147	GR
51.912	7.163	GR
54.258	7.267	GR
56.348	7.418	GR
58.016	7.452	GR
59.352	7.542	GR



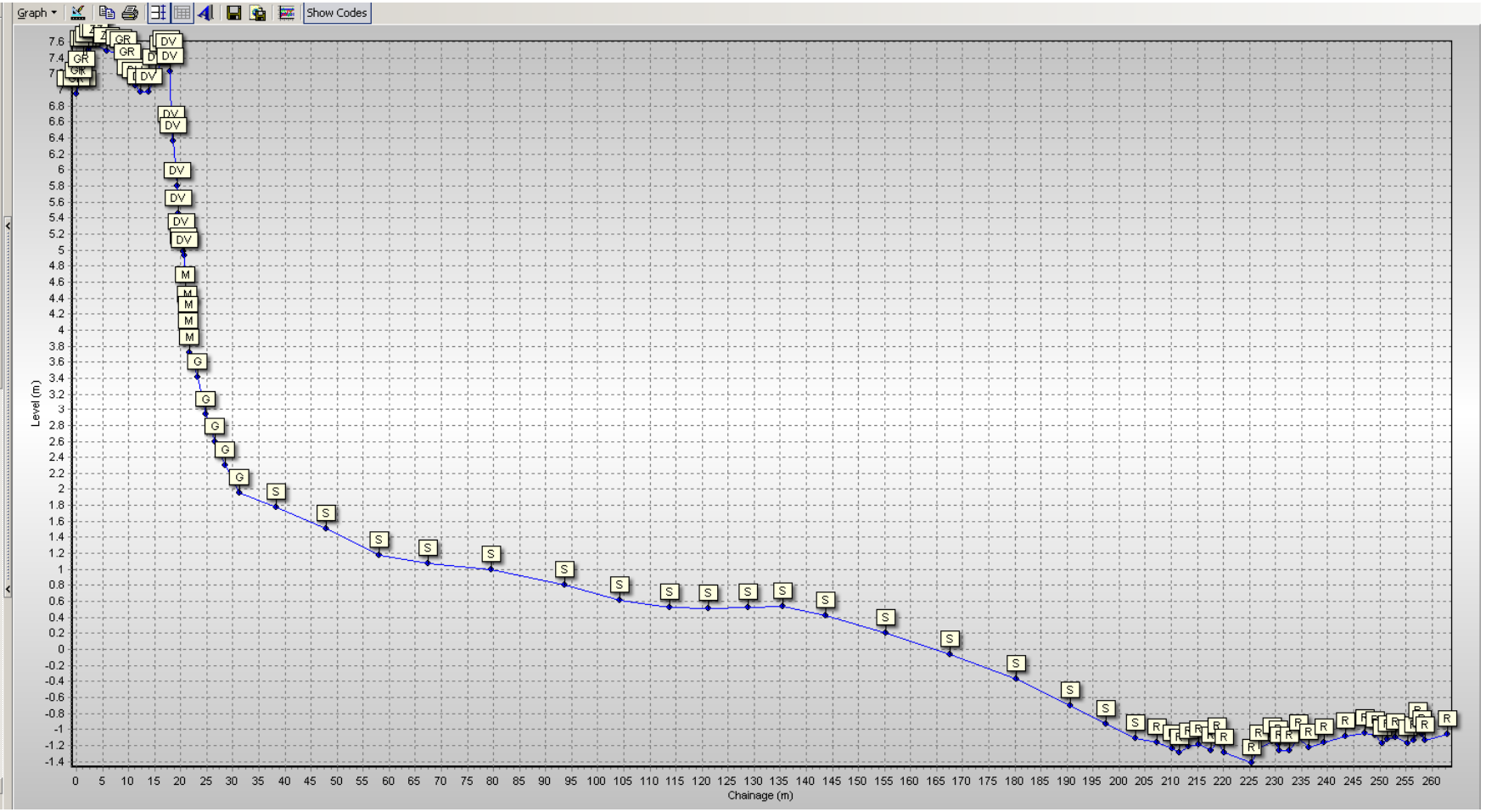
1aADC17 - 06/10/2010

Chainage	Level	Code
0.000	6.950	
0.096	6.950	ZZ
1.972	6.945	ZZ
2.879	7.012	DV
3.445	6.950	DV
3.746	6.808	DV
4.350	6.701	DV
6.393	6.773	DV
7.856	7.013	DV
9.306	7.268	DV
10.497	7.717	DV
11.602	7.816	DV
12.402	8.094	DV
12.743	8.122	DV
13.208	8.085	DV
13.807	7.922	DV
14.165	7.743	DV
14.764	7.510	DV
15.611	7.272	DV
16.181	7.191	DV
16.627	7.196	DV
16.902	7.280	DV
17.303	7.352	DV
17.727	7.586	DV
18.588	7.886	DV
19.200	8.139	DV
19.854	8.324	DV
20.550	8.521	DV
21.321	8.652	DV
21.775	8.565	DV
21.814	7.508	DV
22.670	6.206	DV
23.826	5.226	DV
24.083	4.681	DV
24.567	4.498	DV
24.611	4.136	M
25.362	4.123	M
25.398	3.666	M
25.732	3.312	M
26.351	2.896	M
27.734	2.555	G
30.534	2.198	G

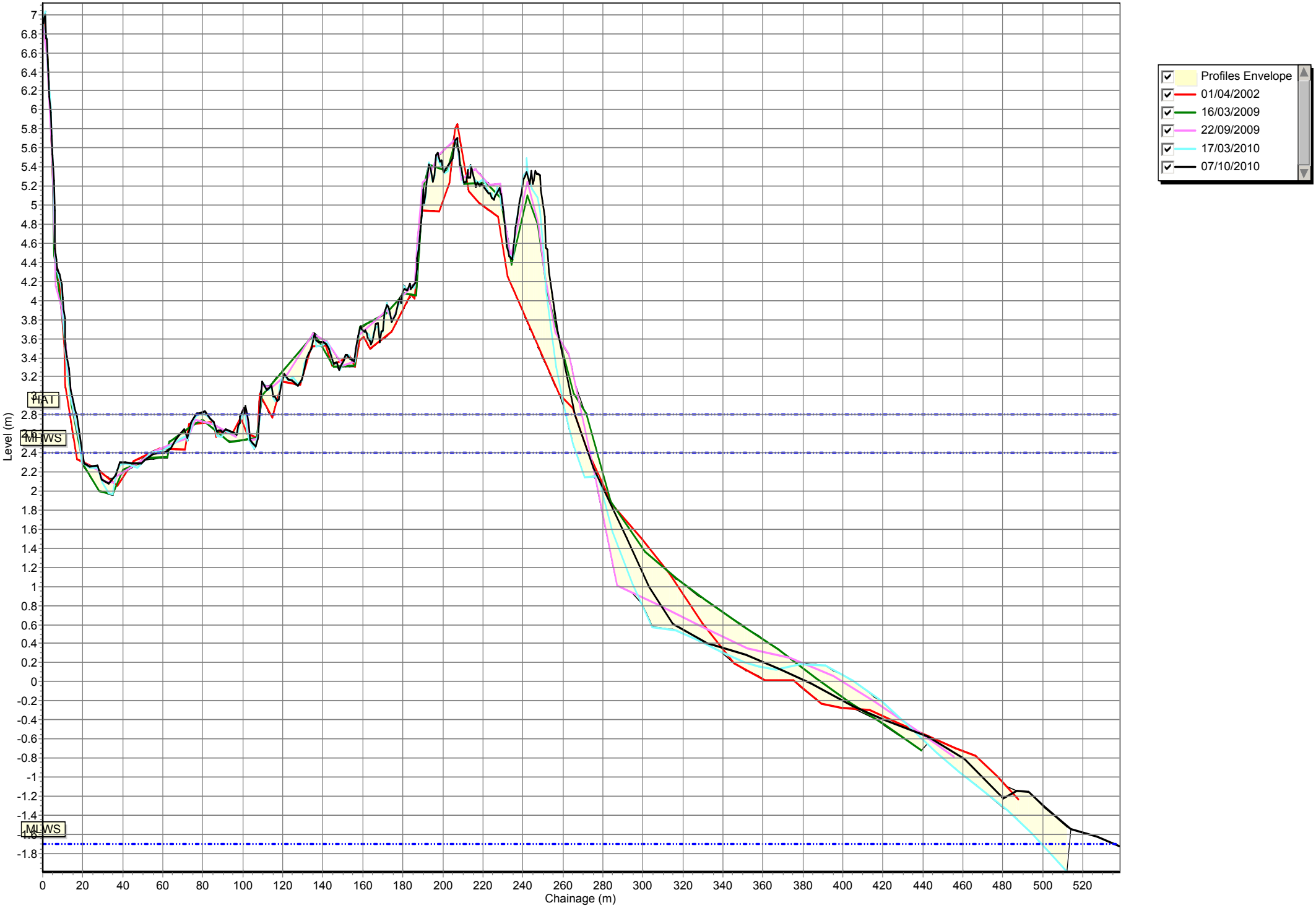


1aADC17A - 06/10/2010

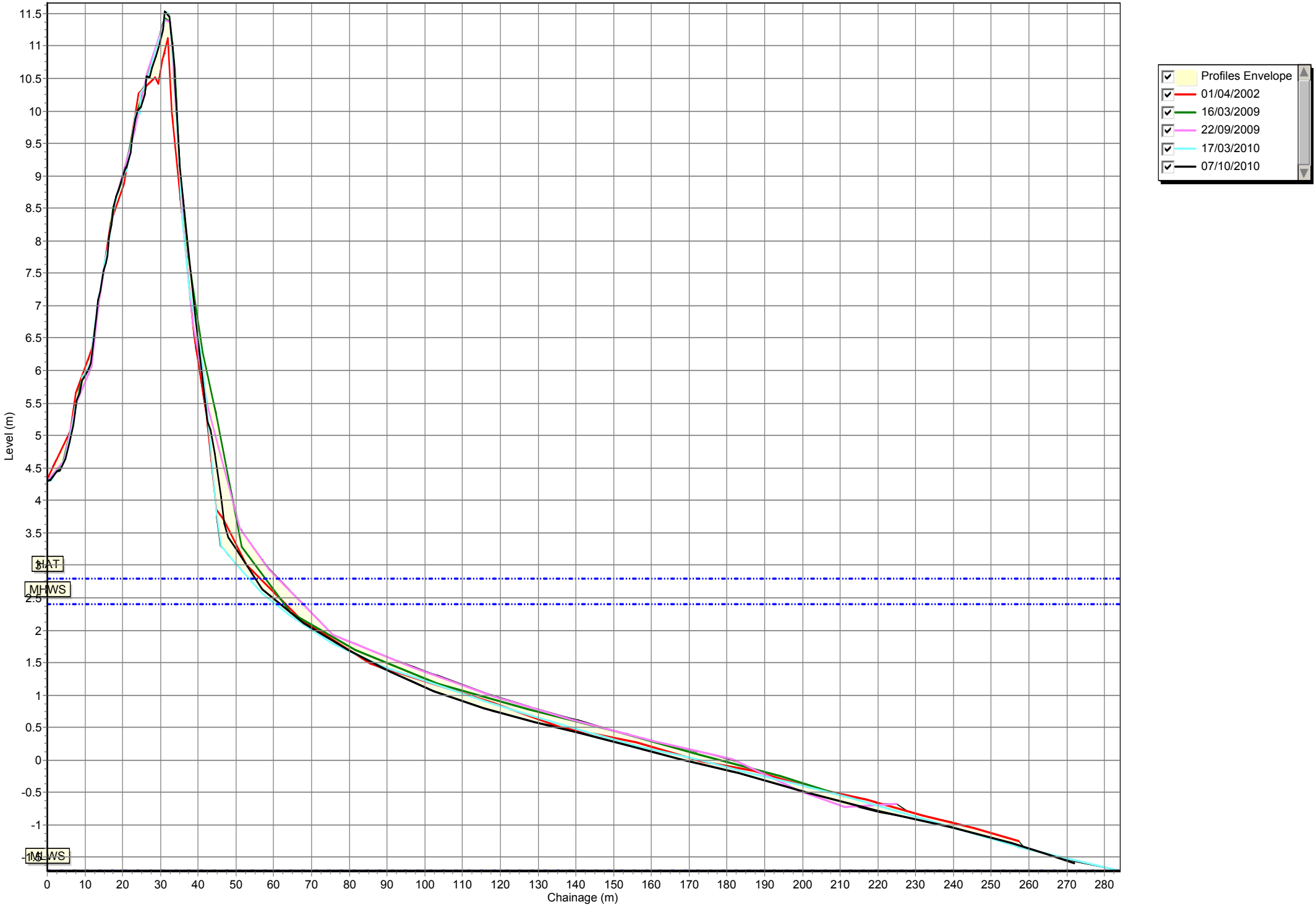
Chainage	Level	Code
0.000	6.953	
0.092	6.953	GR
0.379	7.050	GR
0.908	7.190	GR
1.400	7.451	GR
1.935	7.450	GR
2.399	7.503	GR
3.160	7.563	GR
3.746	7.562	ZZ
5.903	7.491	ZZ
8.287	7.459	ZZ
9.040	7.437	GR
9.797	7.286	GR
10.446	7.087	GR
11.289	7.053	DV
12.275	6.981	DV
13.890	6.971	DV
15.322	7.213	DV
16.613	7.390	DV
17.268	7.445	DV
17.702	7.408	DV
18.043	7.230	DV
18.176	6.500	DV
18.504	6.356	DV
19.408	5.802	DV
19.542	5.450	DV
20.231	5.165	DV
20.471	4.987	DV
20.689	4.926	DV
20.951	4.495	M
21.243	4.254	M
21.477	4.128	M
21.545	3.922	M
21.781	3.714	M
23.331	3.411	G
24.826	2.937	G
26.600	2.591	G
28.524	2.294	G
31.260	1.957	G
38.328	1.778	S
47.931	1.511	S
58.130	1.177	S



Beach Profiles: 1aADC01

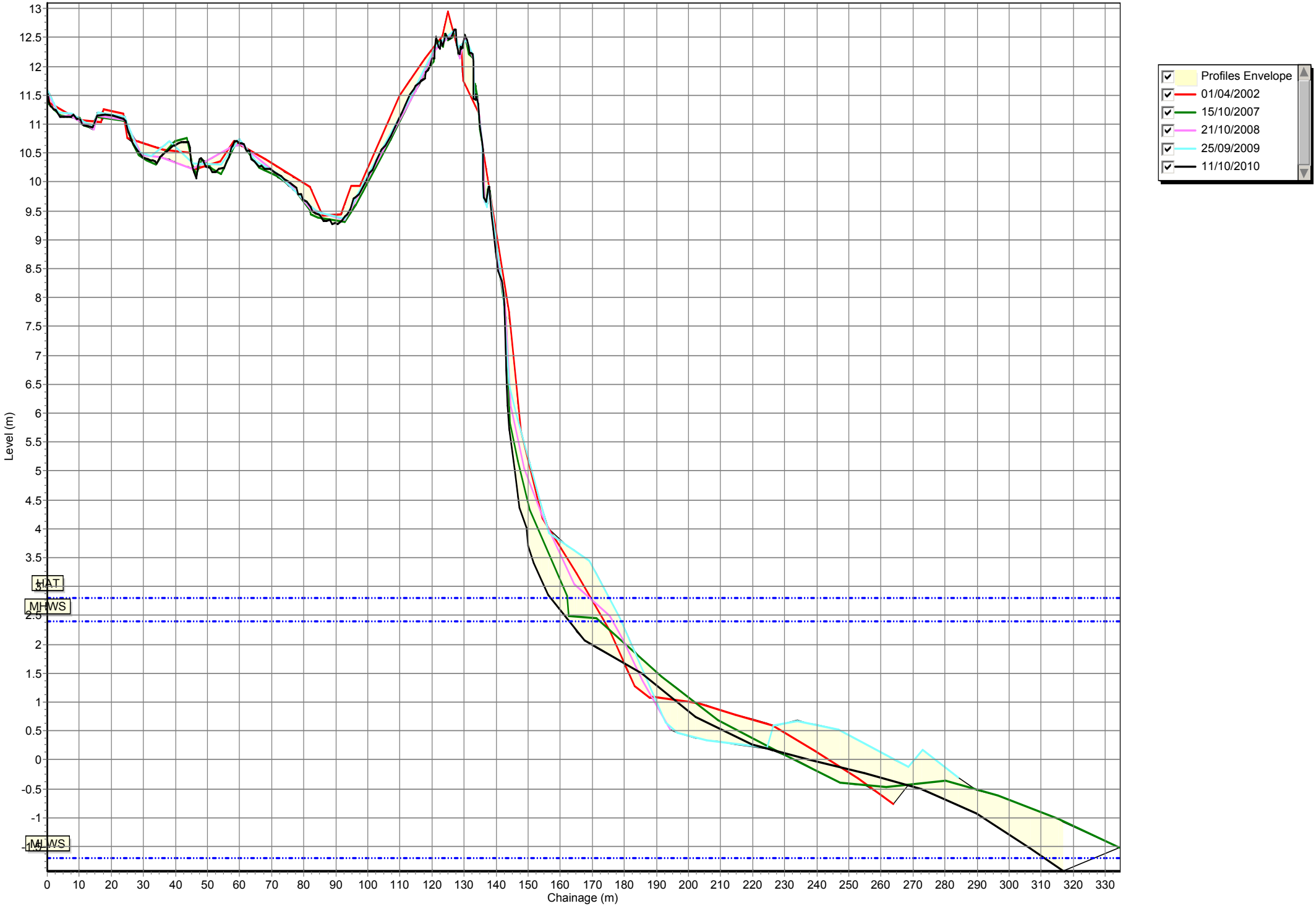


Beach Profiles: 1aADC02

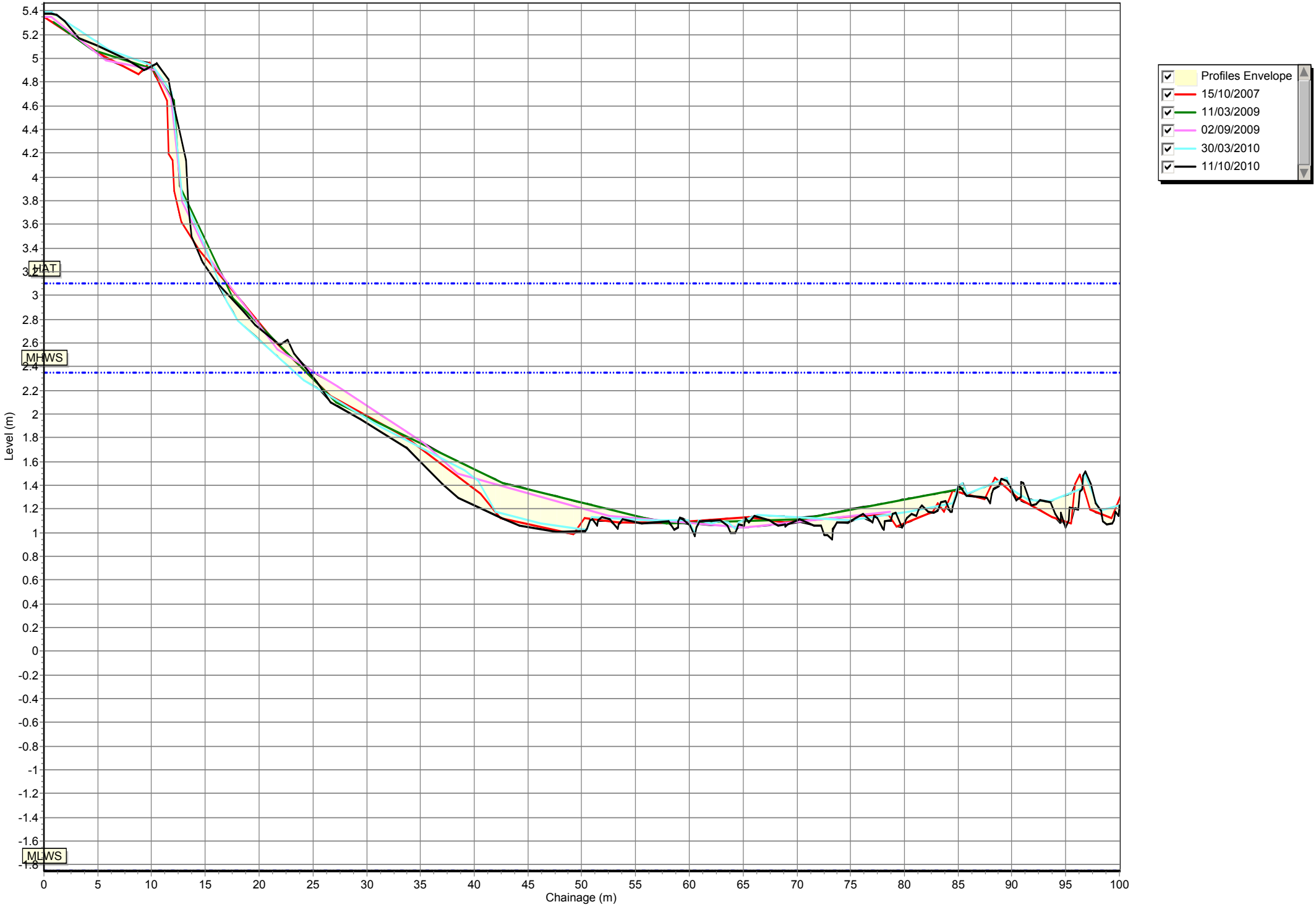


Beach Profiles: 1aADC03

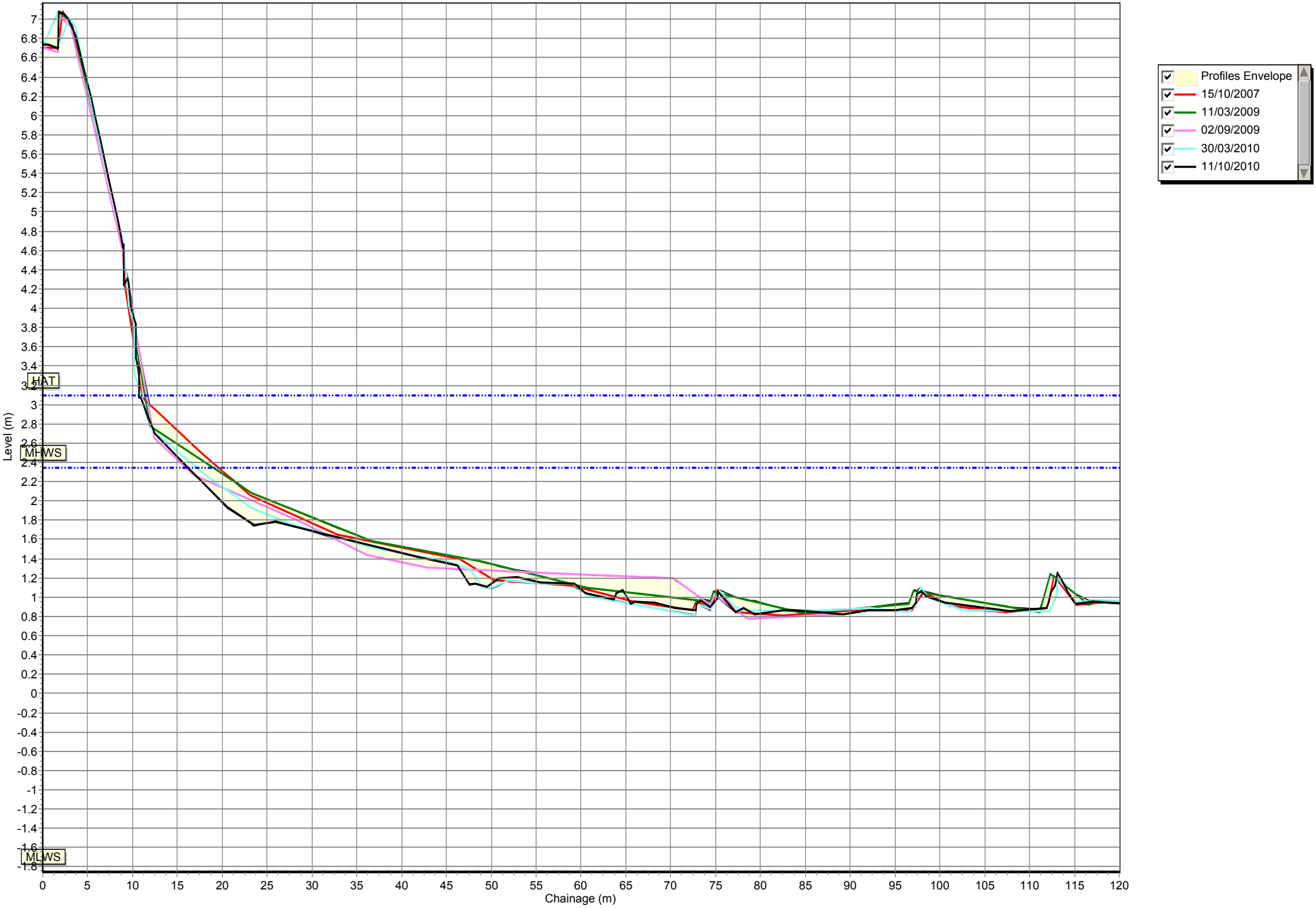
Beach Profiles: 1aADC04



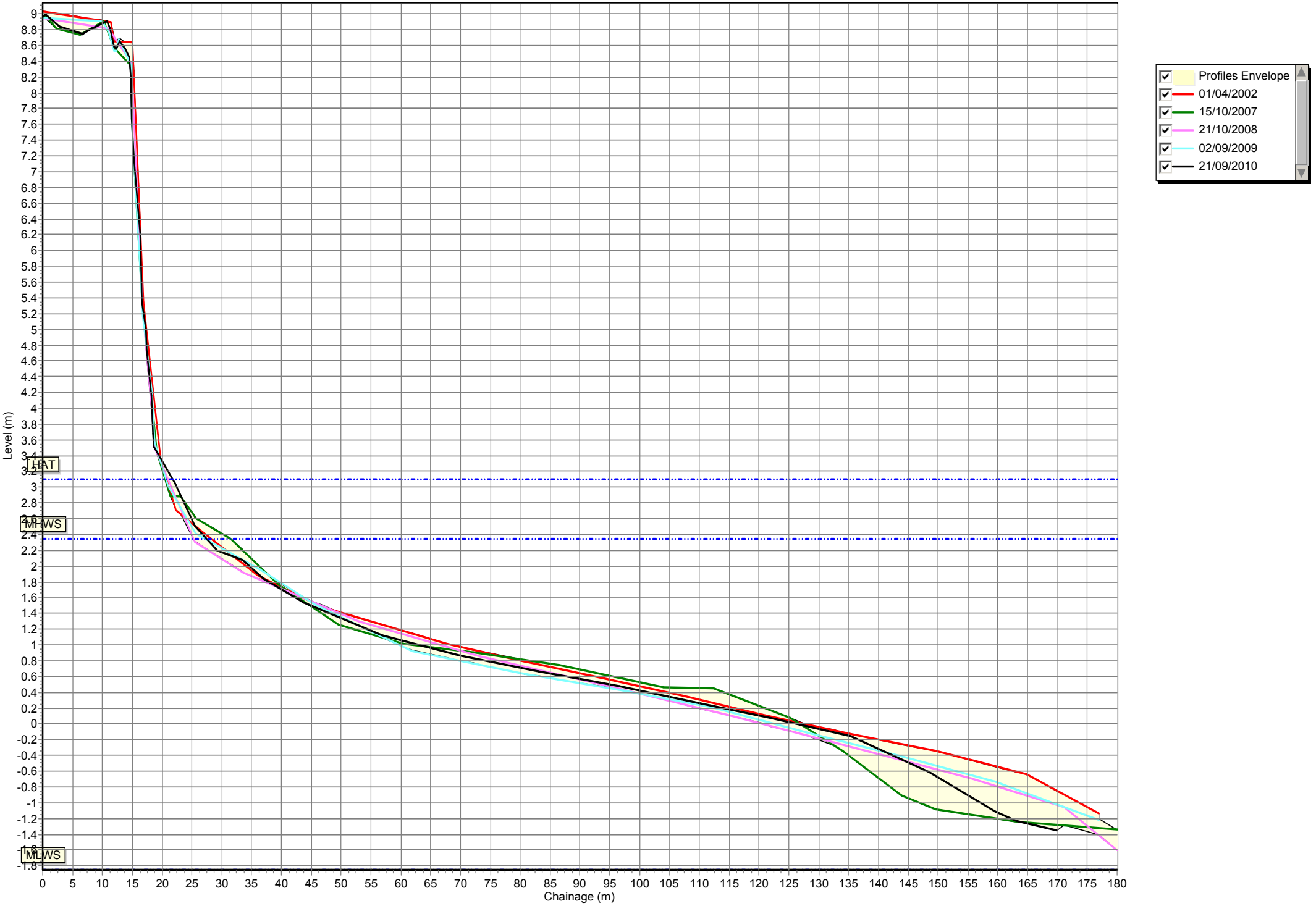
Beach Profiles: 1aADC04A



Beach Profiles: 1aADC04B

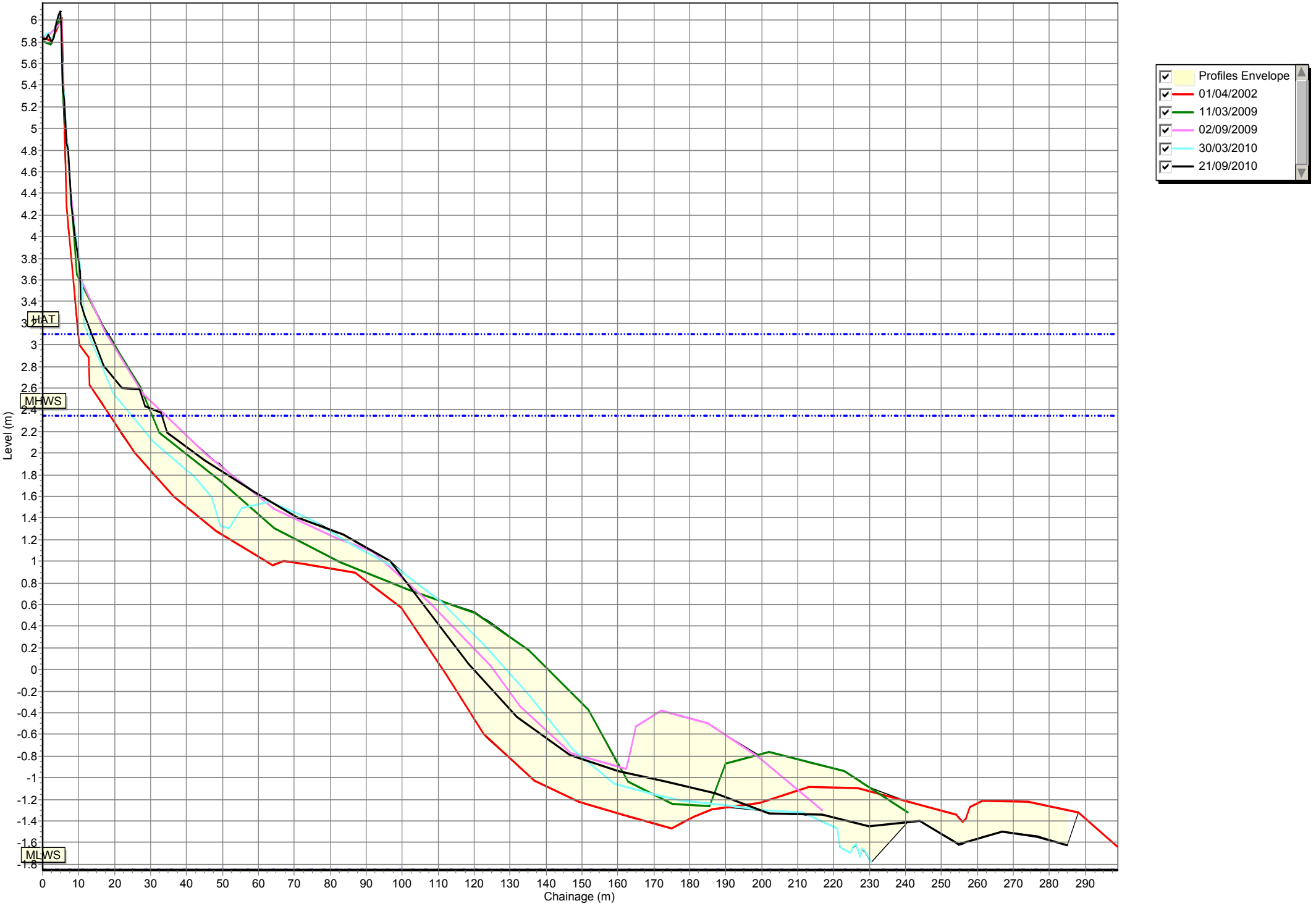


Beach Profiles: 1aADC05



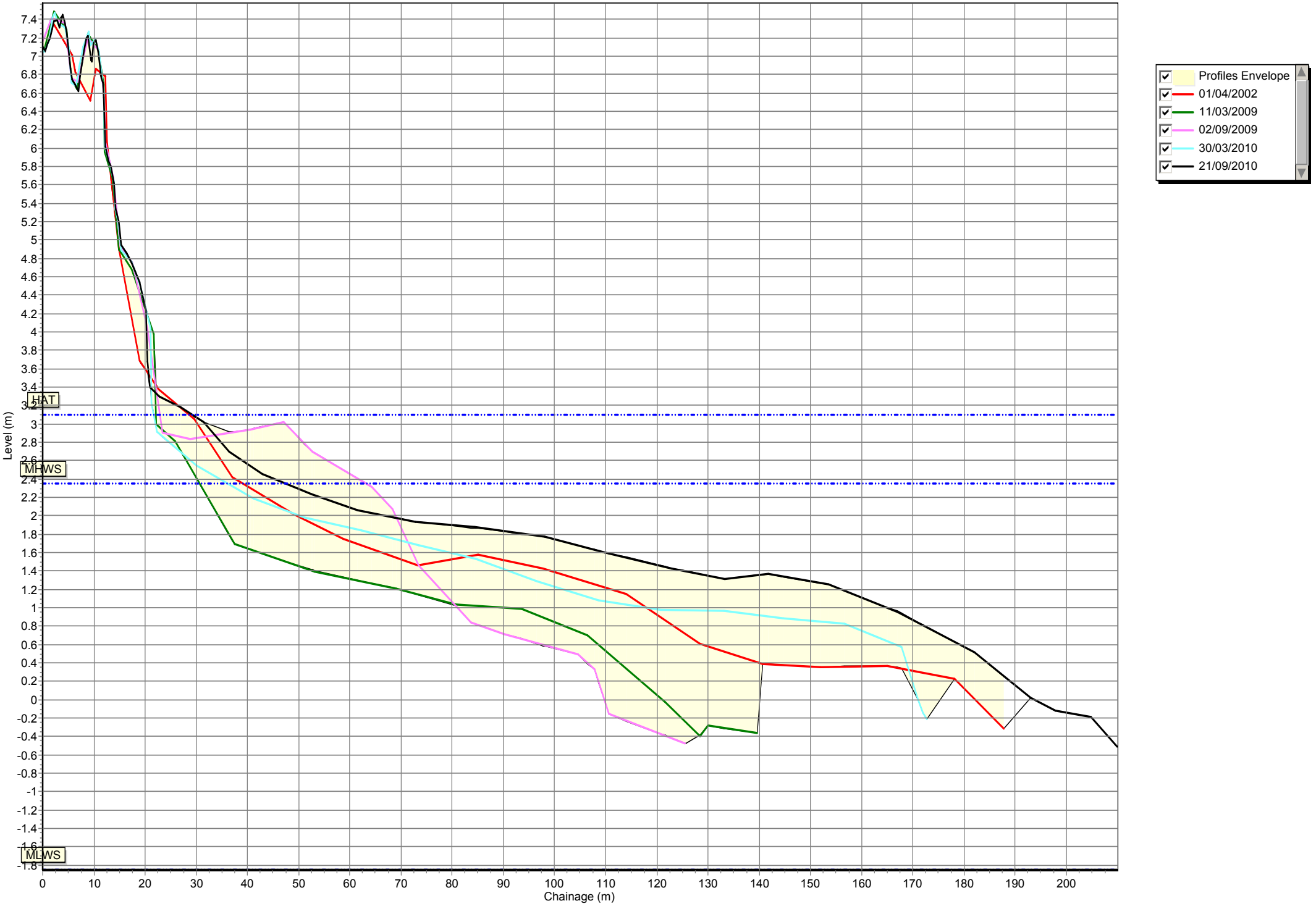
Beach Profiles: 1aADC06

Beach Profiles: 1aADC07

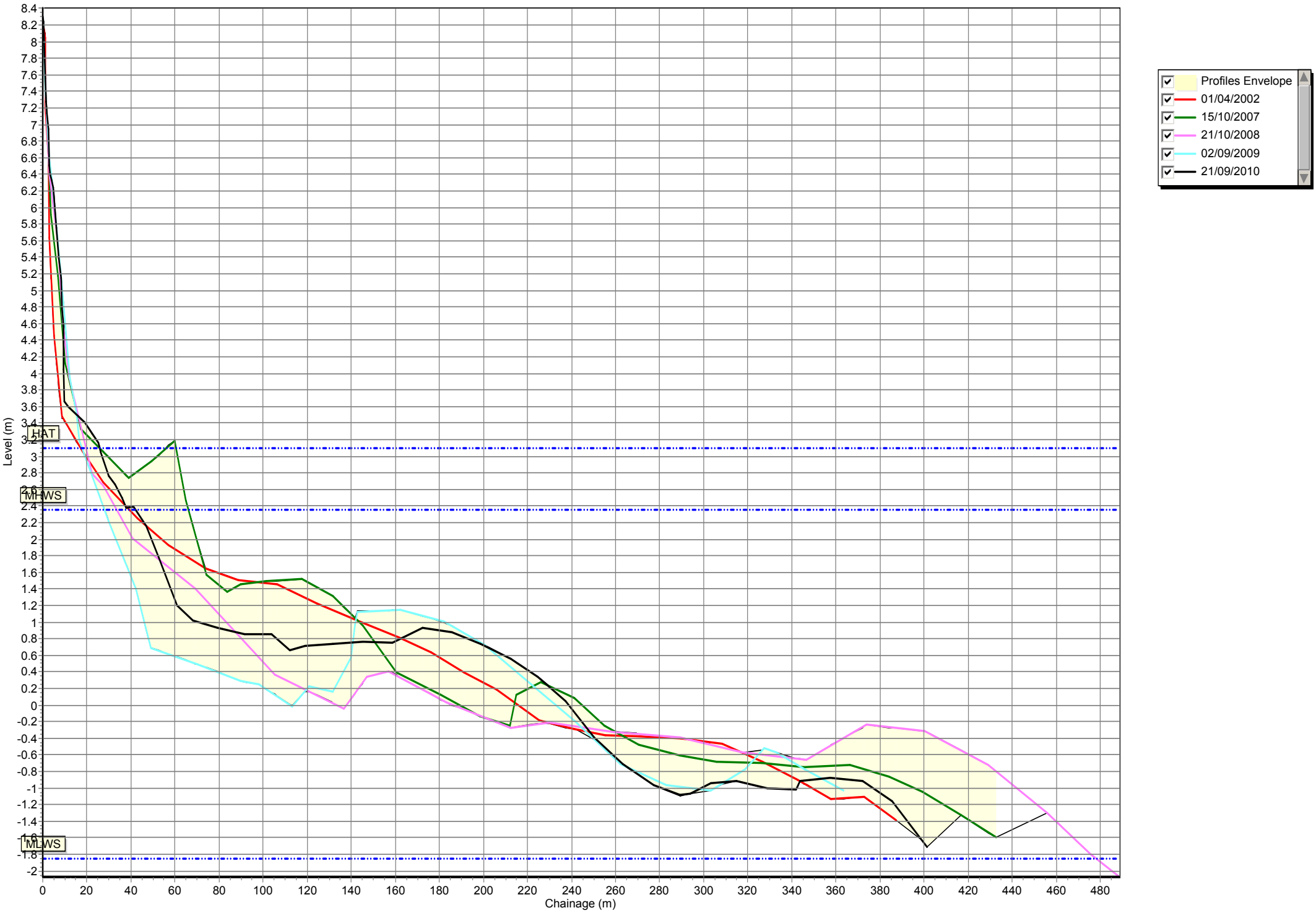


Beach Profiles: 1aADC08

Beach Profiles: 1aADC09

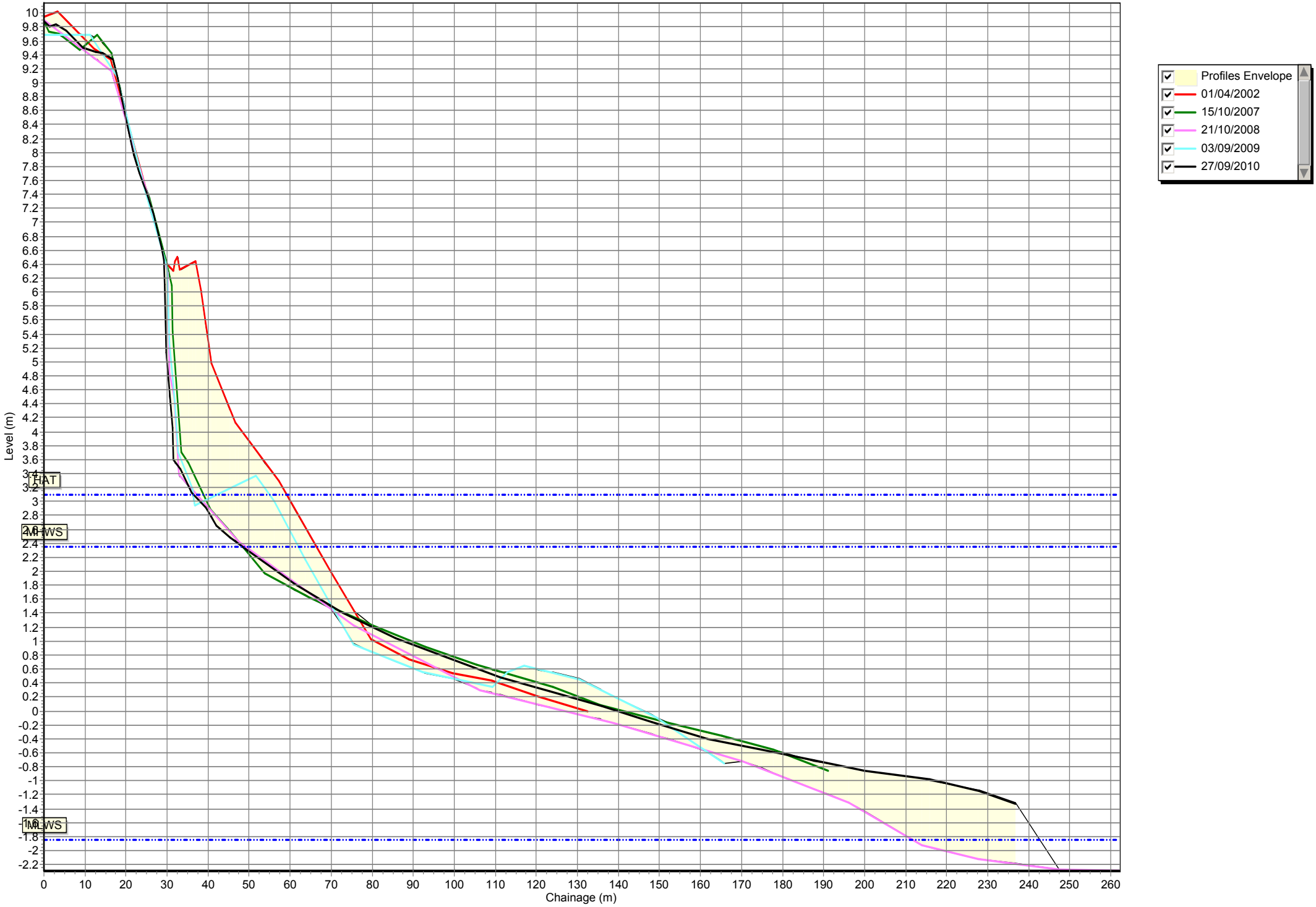


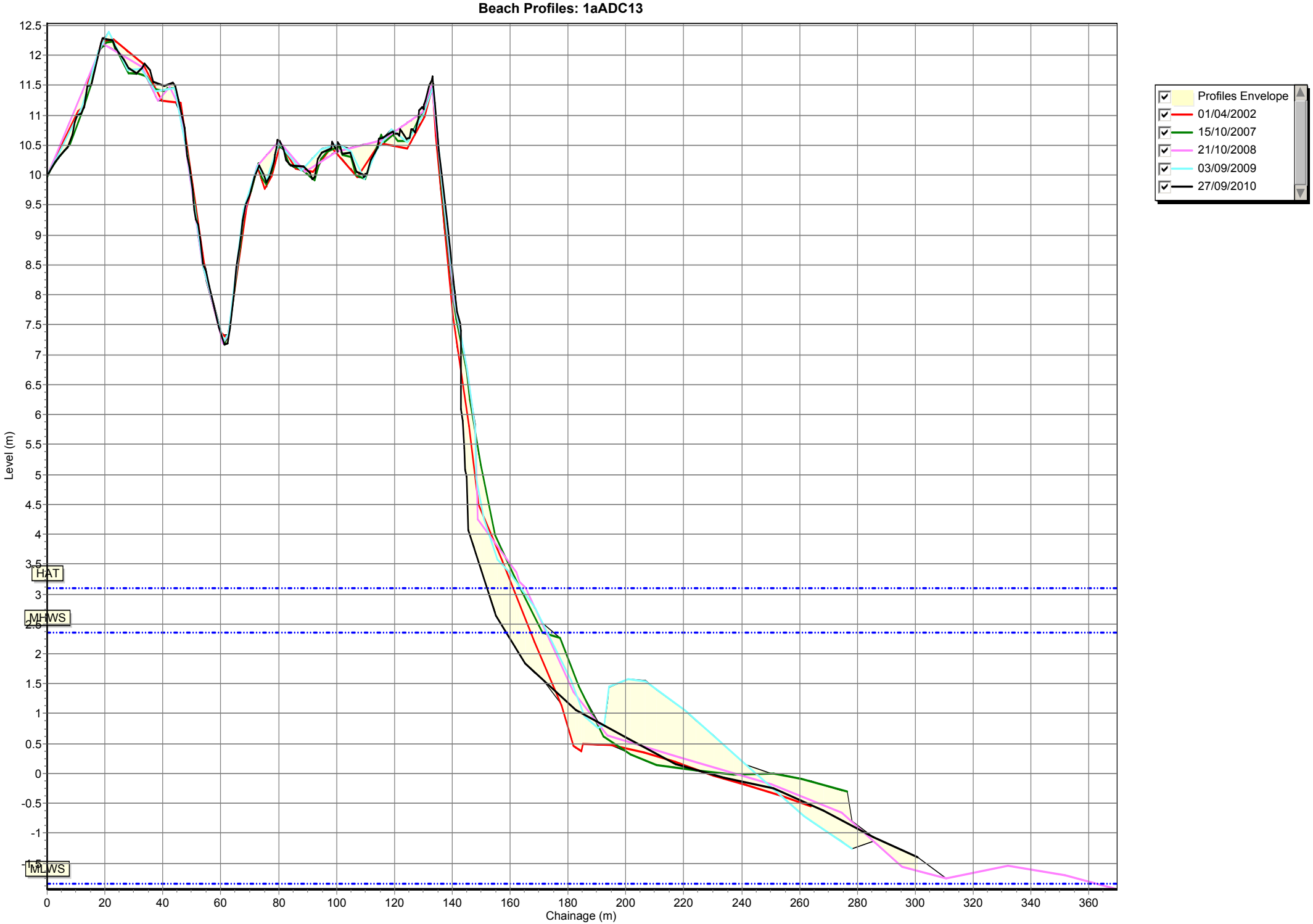
Beach Profiles: 1aADC10



Beach Profiles: 1aADC11

Beach Profiles: 1aADC12




Beach Profiles: 1aADC13
Profiles Envelope
01/04/2002
15/10/2007
21/10/2008
03/09/2009
27/09/2010
HAT
MHWS
MLWS
Level (m)
Chainage (m)
12.5
12
11.5
11
10.5
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
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0.5
0
-0.5
-1
-1.5
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340
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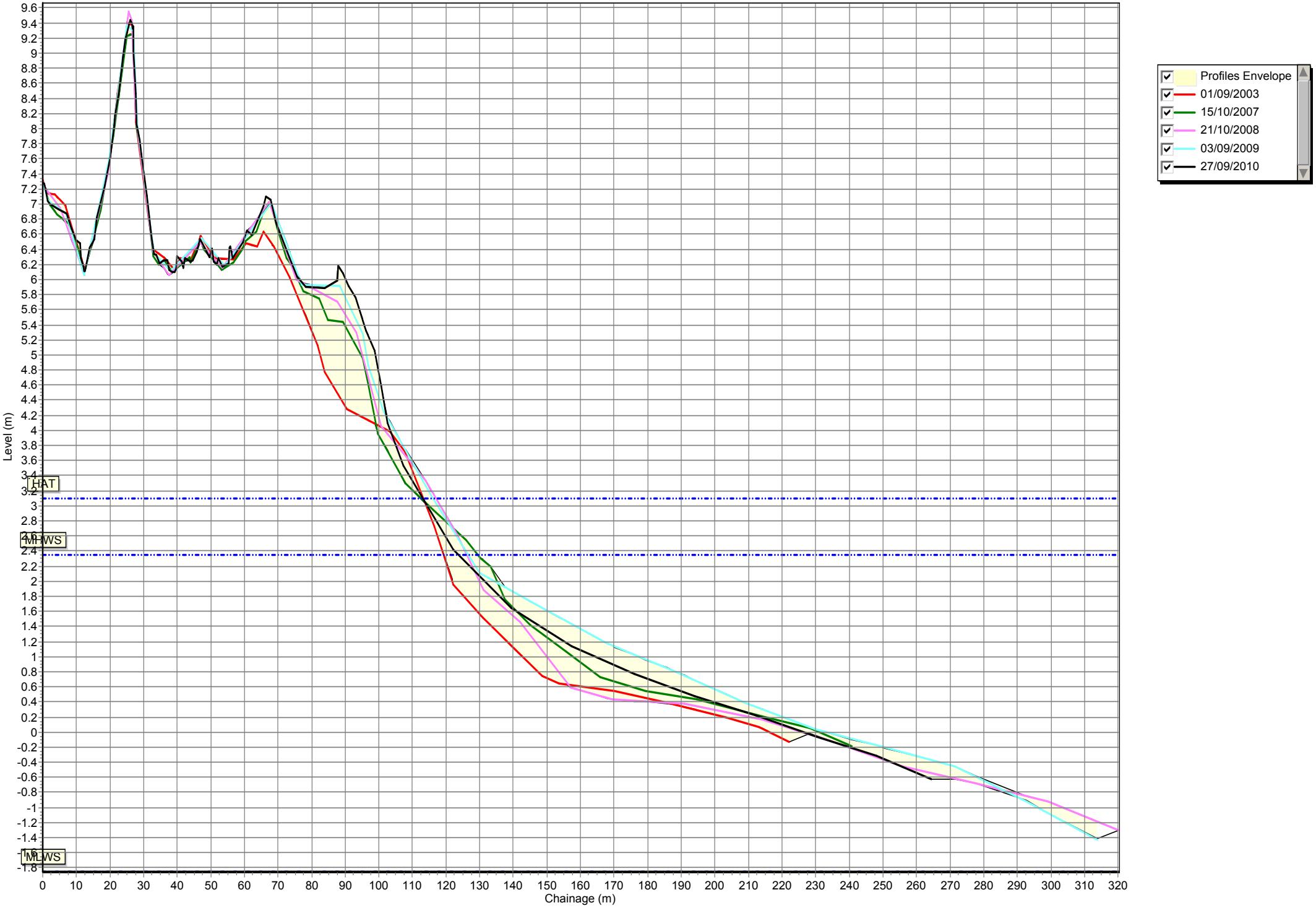
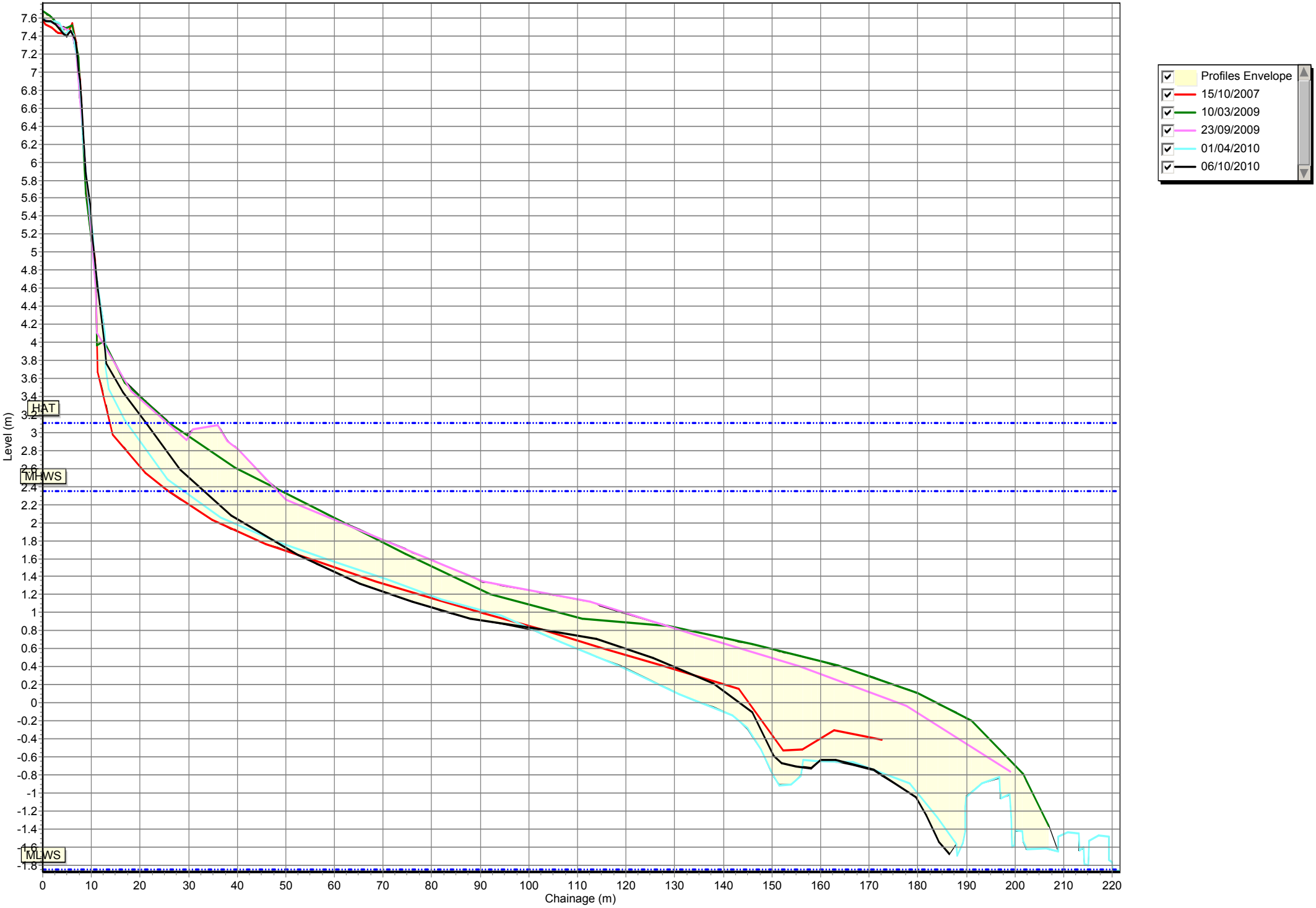
Beach Profiles: 1aADC14

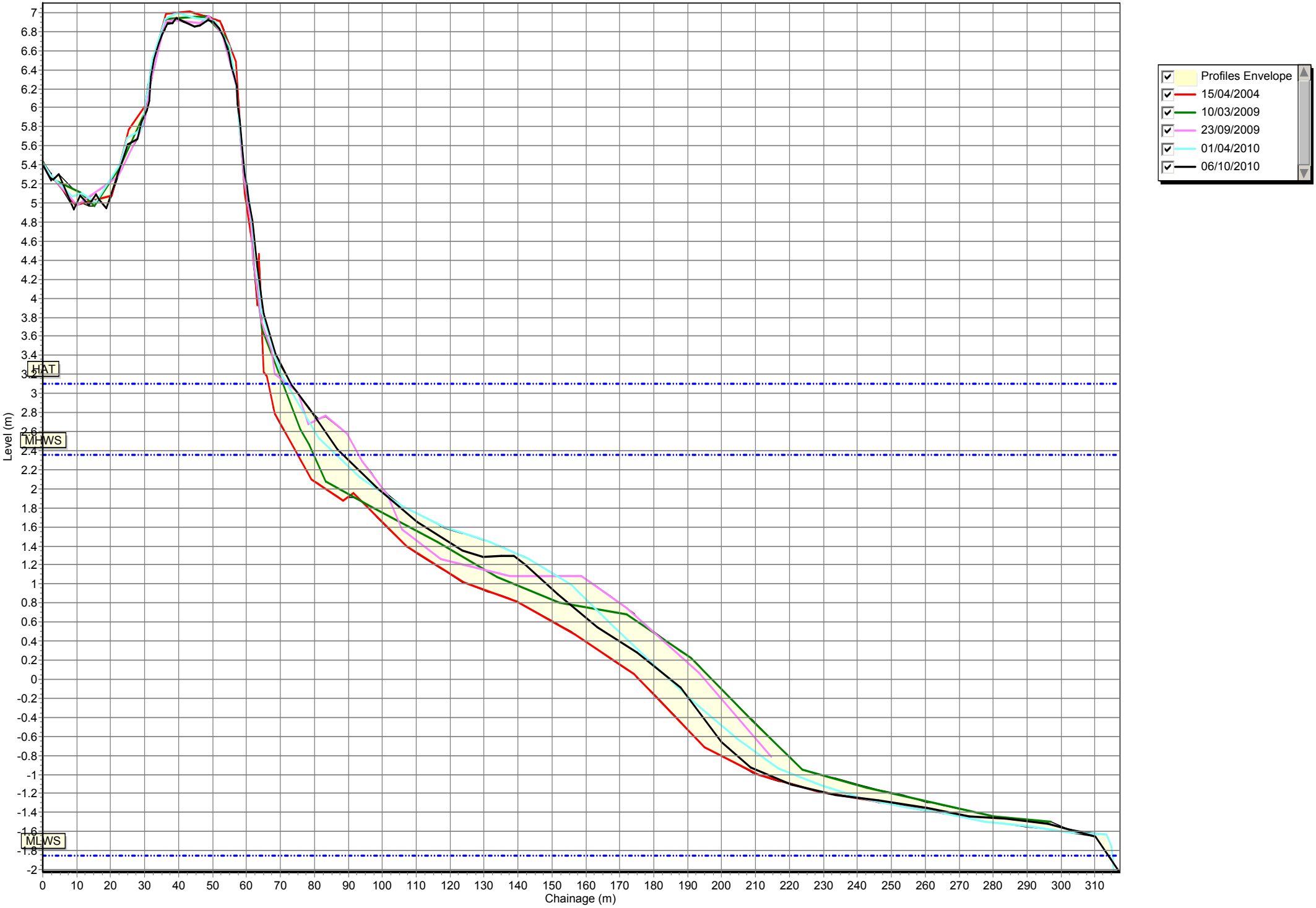


Beach Profiles: 1aADC15

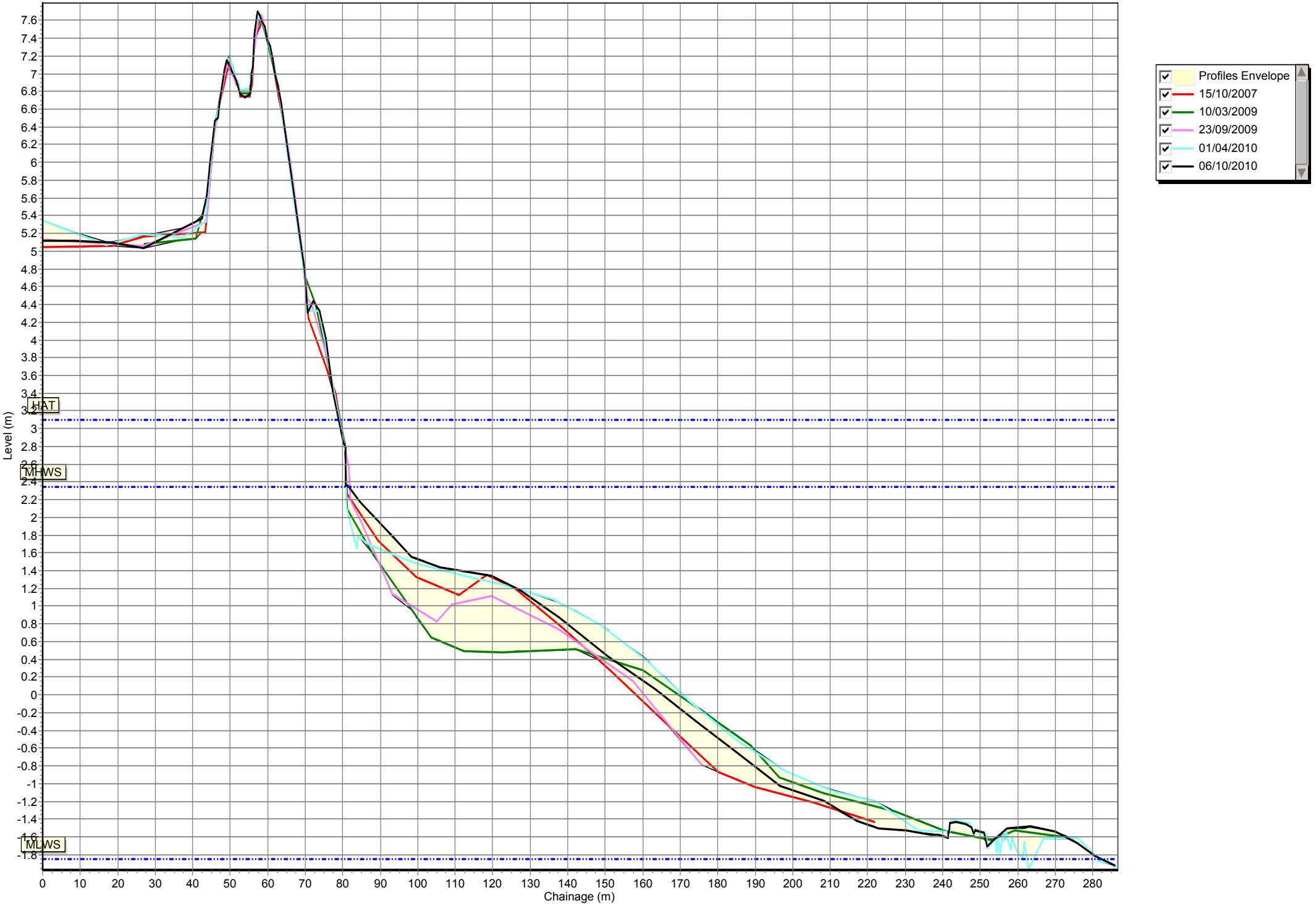
Beach Profiles: 1aADC15A



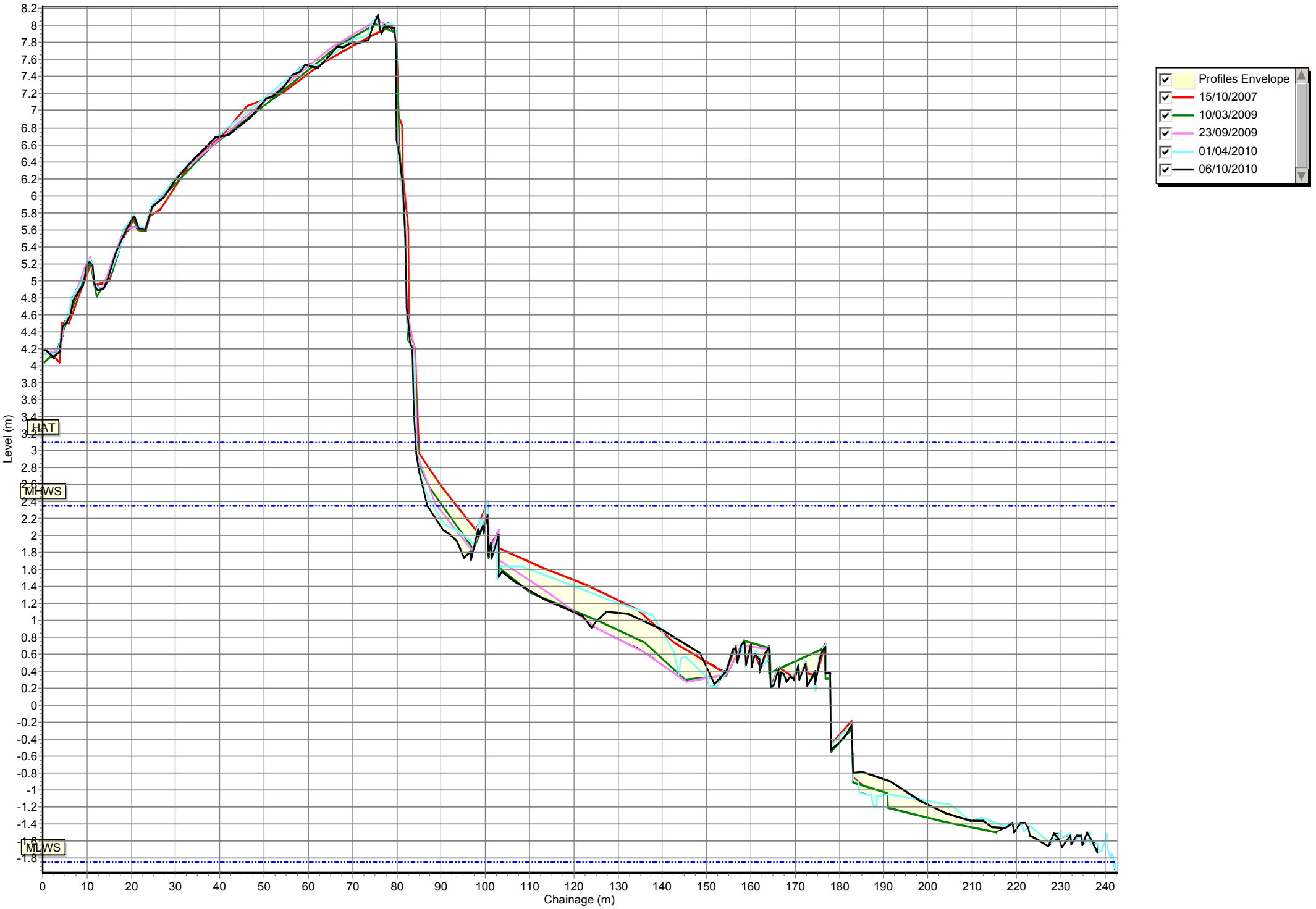
Beach Profiles: 1aADC16



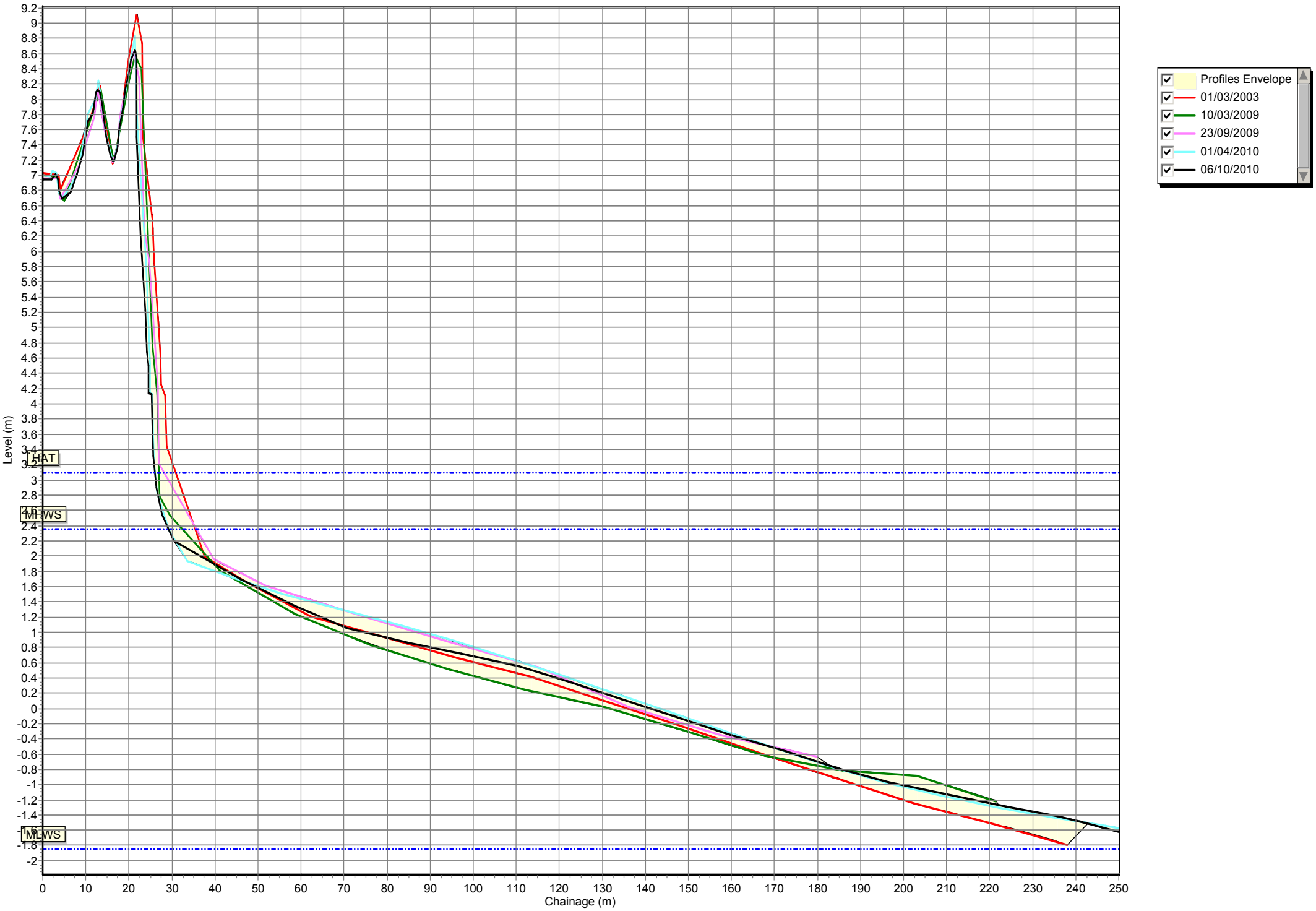
Beach Profiles: 1aADC16A



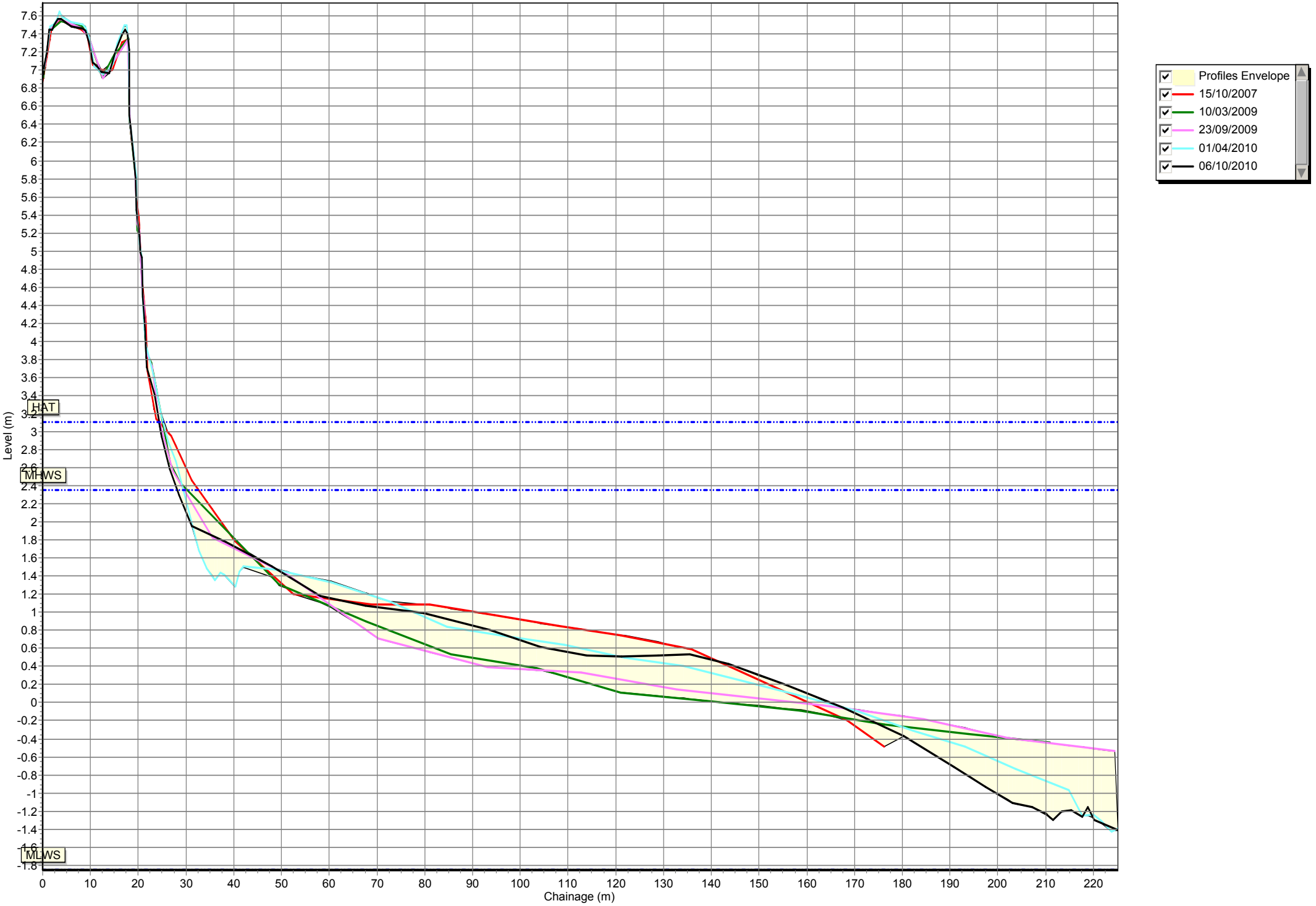
Beach Profiles: 1aADC16B



Beach Profiles: 1aADC17



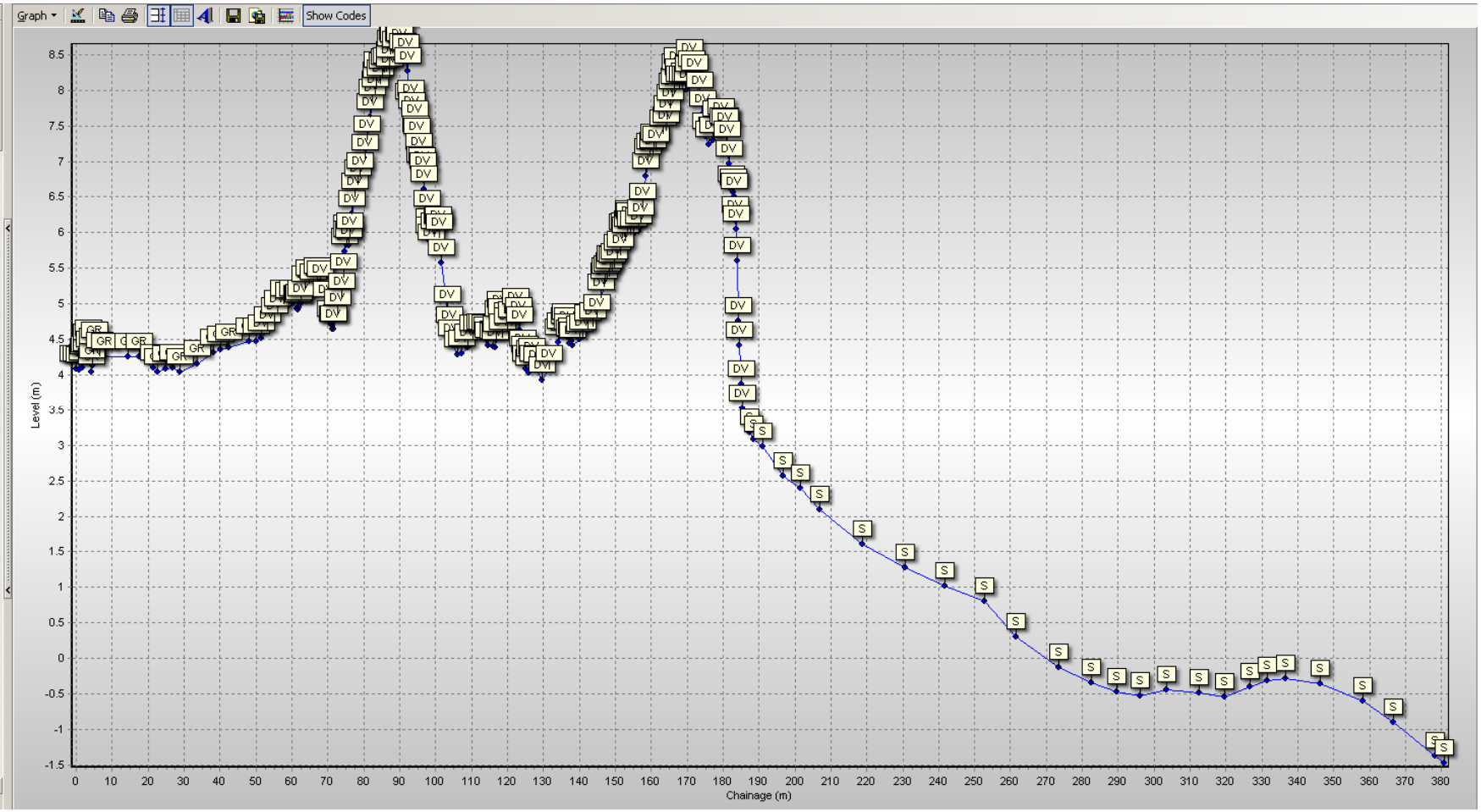
Beach Profiles: 1aADC17A



Northumberland CC (Castle Morpeth)

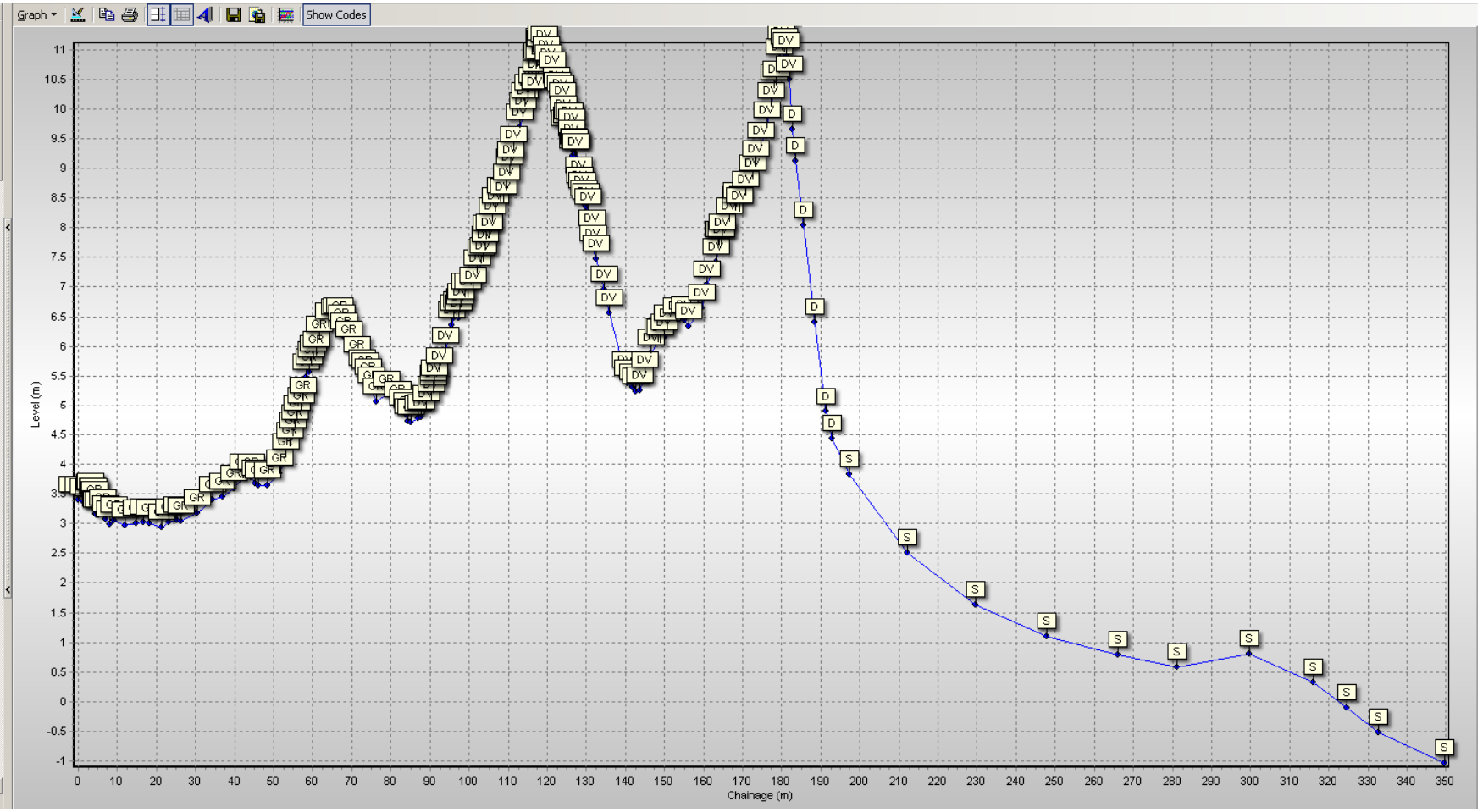
1aCMBC01 - 06/10/2010

Chainage	Level	Code
0.000	4.080	
0.031	4.080	ZZ
0.925	4.075	ZZ
1.701	4.098	ZZ
2.064	4.180	GR
2.319	4.215	GR
2.732	4.234	GR
2.952	4.387	GR
3.386	4.438	GR
3.779	4.280	GR
4.118	4.044	GR
4.443	4.125	GR
4.538	4.333	GR
4.976	4.412	GR
6.559	4.273	GR
8.060	4.256	GR
14.480	4.250	GR
17.648	4.252	GR
21.625	4.104	GR
22.749	4.041	GR
24.842	4.087	GR
26.954	4.102	GR
29.010	4.037	GR
33.635	4.156	GR
38.202	4.308	GR
40.336	4.356	GR
42.478	4.388	GR
48.066	4.471	GR
50.158	4.465	GR
51.489	4.516	DV
53.113	4.635	DV
55.328	4.761	DV
55.962	4.856	DV
57.830	4.999	DV
59.125	4.980	DV
60.225	5.002	DV
61.299	4.935	DV
61.605	4.910	DV
61.913	4.944	DV
62.630	5.002	DV
63.769	5.201	DV
64.779	5.289	DV



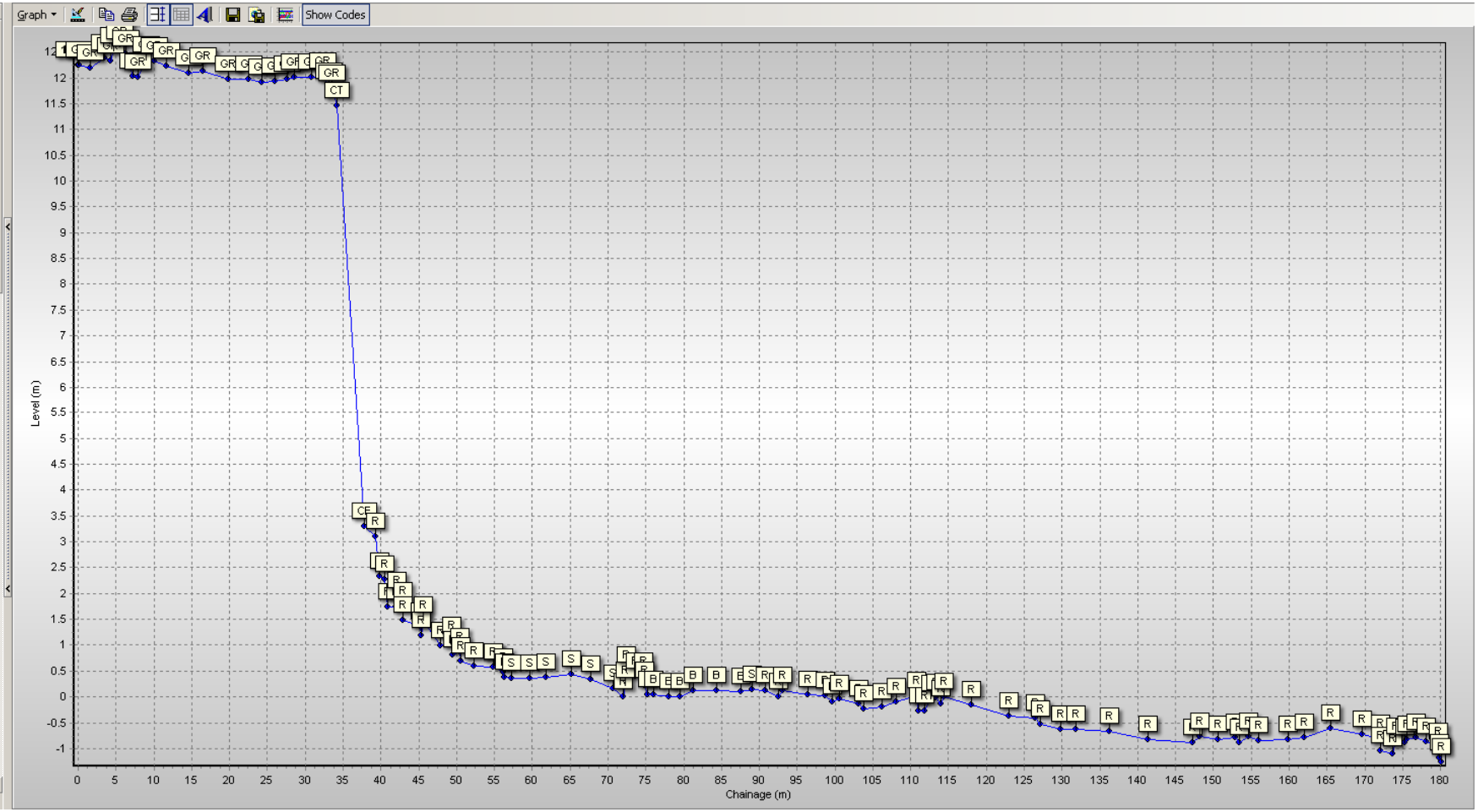
1aCMBC02 - 06/10/2010

Chainage	Level	Code
0.000	3.392	
0.034	3.392	ZZ
1.216	3.361	ZZ
2.567	3.338	ZZ
2.691	3.371	GR
2.795	3.433	GR
3.040	3.446	GR
3.581	3.375	GR
4.009	3.362	GR
4.171	3.319	GR
4.305	3.161	GR
4.756	3.144	GR
5.300	3.143	GR
6.133	3.177	GR
7.106	3.067	GR
8.173	2.996	GR
9.045	3.052	GR
12.009	2.977	GR
14.763	3.013	GR
16.603	3.023	GR
18.212	3.003	GR
21.228	2.938	GR
23.249	3.014	GR
25.153	3.062	GR
26.283	3.031	GR
30.335	3.178	GR
34.302	3.401	GR
37.087	3.456	GR
39.903	3.583	GR
42.224	3.779	GR
44.131	3.778	GR
45.198	3.682	GR
46.079	3.648	GR
48.464	3.642	GR
51.583	3.842	GR
53.189	4.119	GR
54.207	4.305	GR
54.893	4.484	GR
55.375	4.623	GR
56.076	4.770	GR
56.896	4.918	GR
57.472	5.083	GR



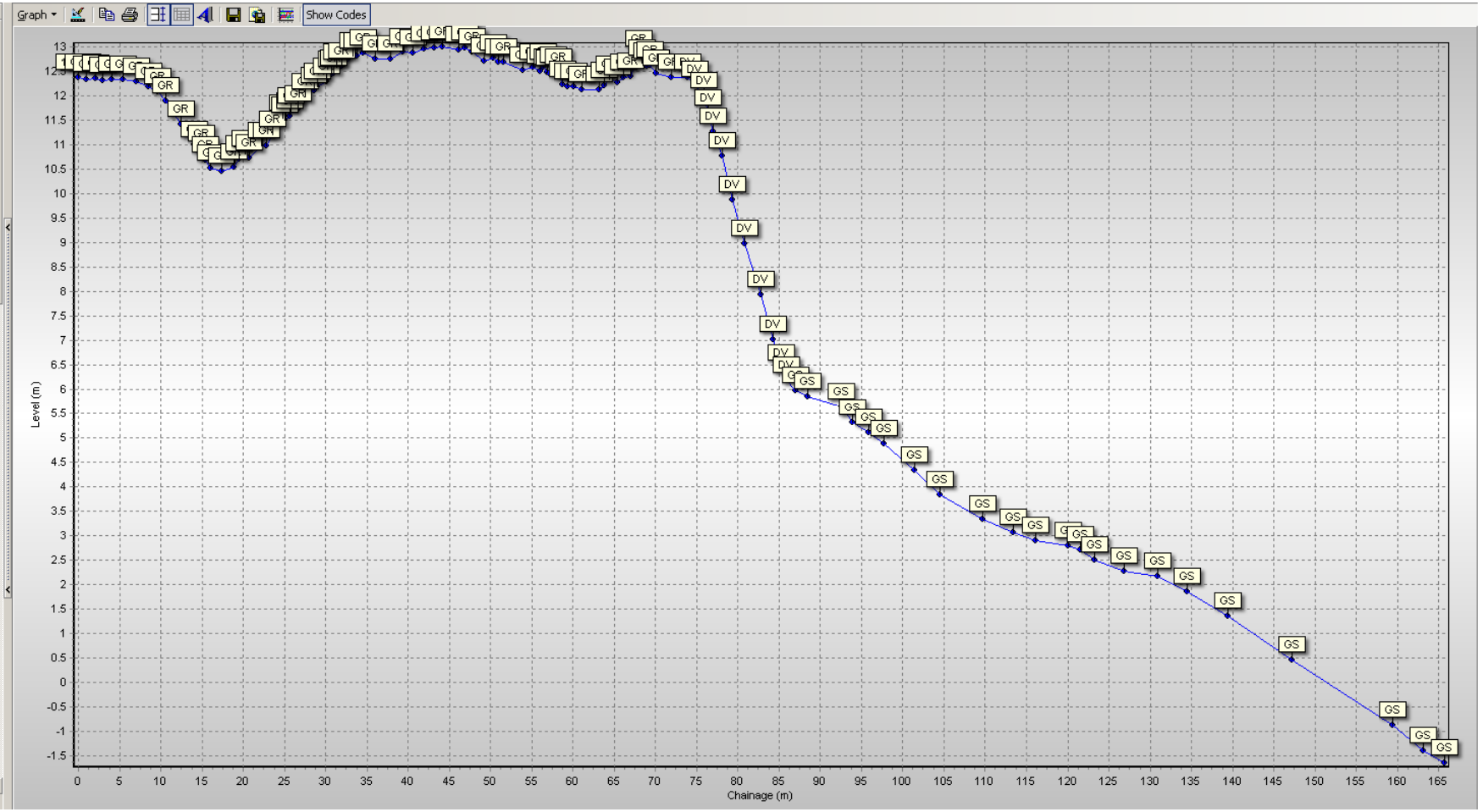
1aCMBC03 - 05/10/2010

Chainage	Level	Code
0.000	12.239	
0.090	12.239	GR
1.652	12.191	GR
3.519	12.391	GR
4.290	12.325	GR
4.743	12.518	GR
5.492	12.602	GR
6.286	12.459	GR
7.264	12.034	GR
7.939	12.001	GR
8.986	12.353	GR
10.104	12.321	GR
11.732	12.228	GR
14.684	12.084	GR
16.474	12.123	GR
19.903	11.980	GR
22.553	11.964	GR
24.300	11.913	GR
26.026	11.933	GR
27.646	11.962	GR
28.542	12.018	GR
30.877	12.013	GR
32.299	12.035	GR
33.144	11.829	GR
33.494	11.784	GR
34.256	11.461	CT
37.863	3.295	CE
39.296	3.103	R
39.876	2.332	R
40.560	2.267	R
40.874	1.742	R
41.935	1.744	R
42.086	1.958	R
42.870	1.764	R
42.919	1.476	R
45.185	1.365	R
45.274	1.190	R
45.564	1.484	R
47.838	0.996	R
49.395	1.083	R
49.479	0.803	R
50.458	0.871	R



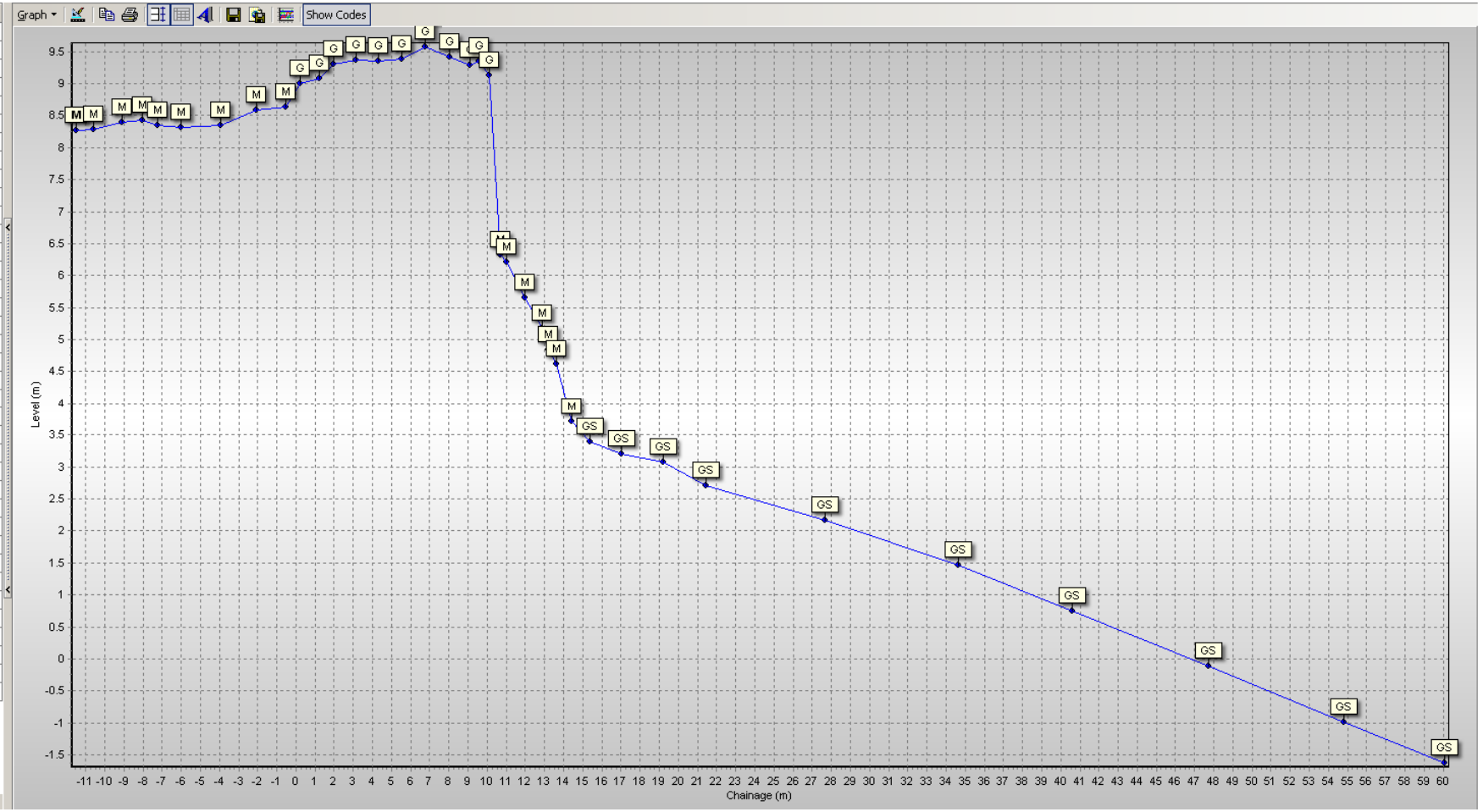
1aCMBC03A - 05/10/2010

Chainage	Level	Code
0.000	12.365	
0.044	12.365	GR
0.942	12.330	GR
2.122	12.354	GR
2.927	12.309	GR
4.131	12.319	GR
5.468	12.330	GR
7.079	12.280	GR
8.478	12.187	GR
9.605	12.071	GR
10.566	11.882	GR
12.490	11.421	GR
14.121	10.998	GR
14.890	10.908	GR
15.411	10.683	GR
16.086	10.507	GR
17.443	10.453	GR
18.823	10.531	GR
19.505	10.695	GR
20.188	10.808	GR
20.763	10.716	GR
22.174	10.972	GR
22.780	10.982	GR
23.519	11.208	GR
24.860	11.538	GR
25.108	11.496	GR
25.619	11.581	GR
25.787	11.681	GR
26.593	11.730	GR
27.550	11.980	GR
28.602	12.102	GR
28.999	12.192	GR
30.146	12.286	GR
30.677	12.439	GR
30.987	12.444	GR
31.401	12.575	GR
31.932	12.593	GR
33.314	12.810	GR
33.857	12.816	GR
34.562	12.862	GR
36.038	12.753	GR
37.890	12.741	GR

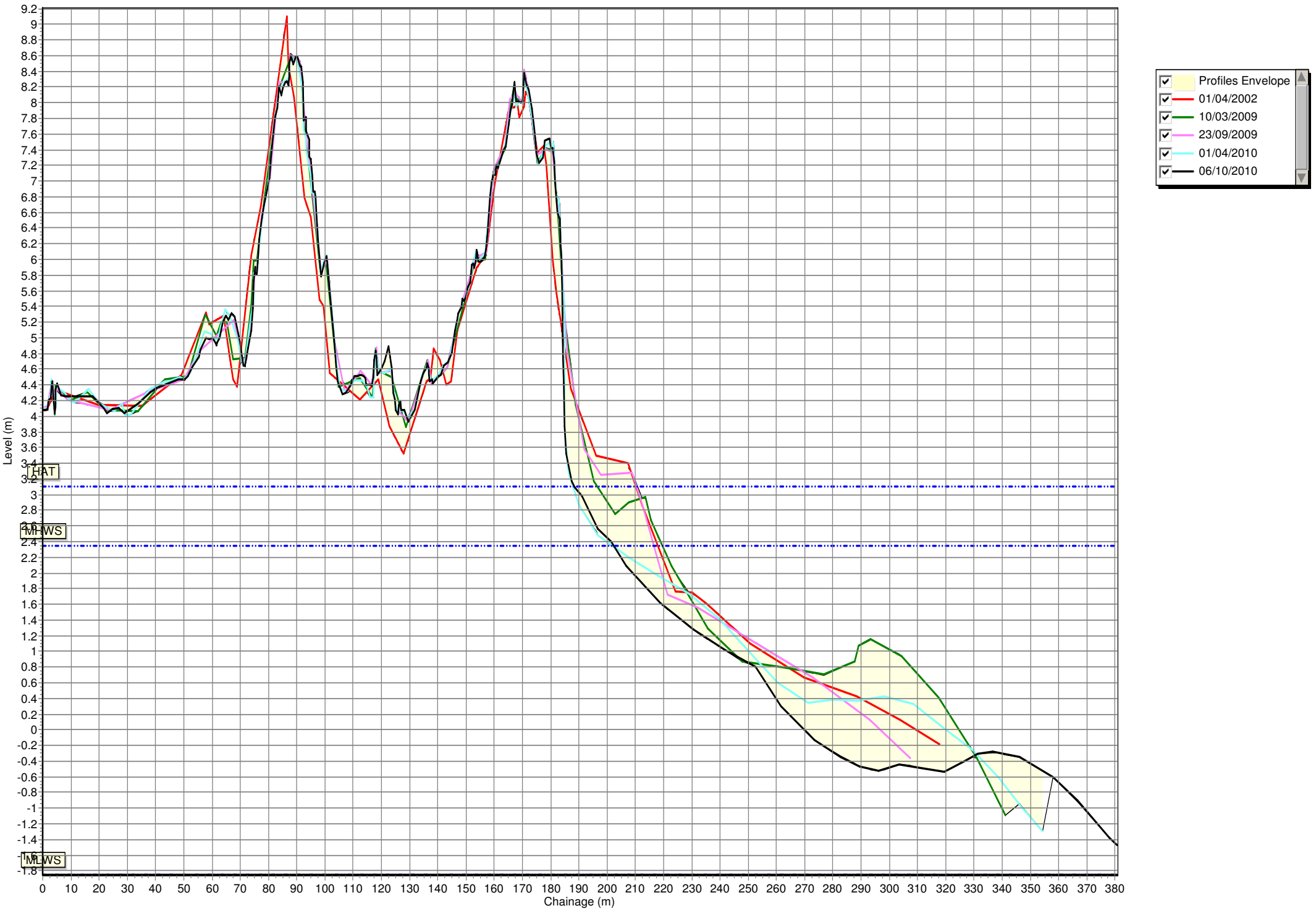


1aCMBC03B - 05/10/2010

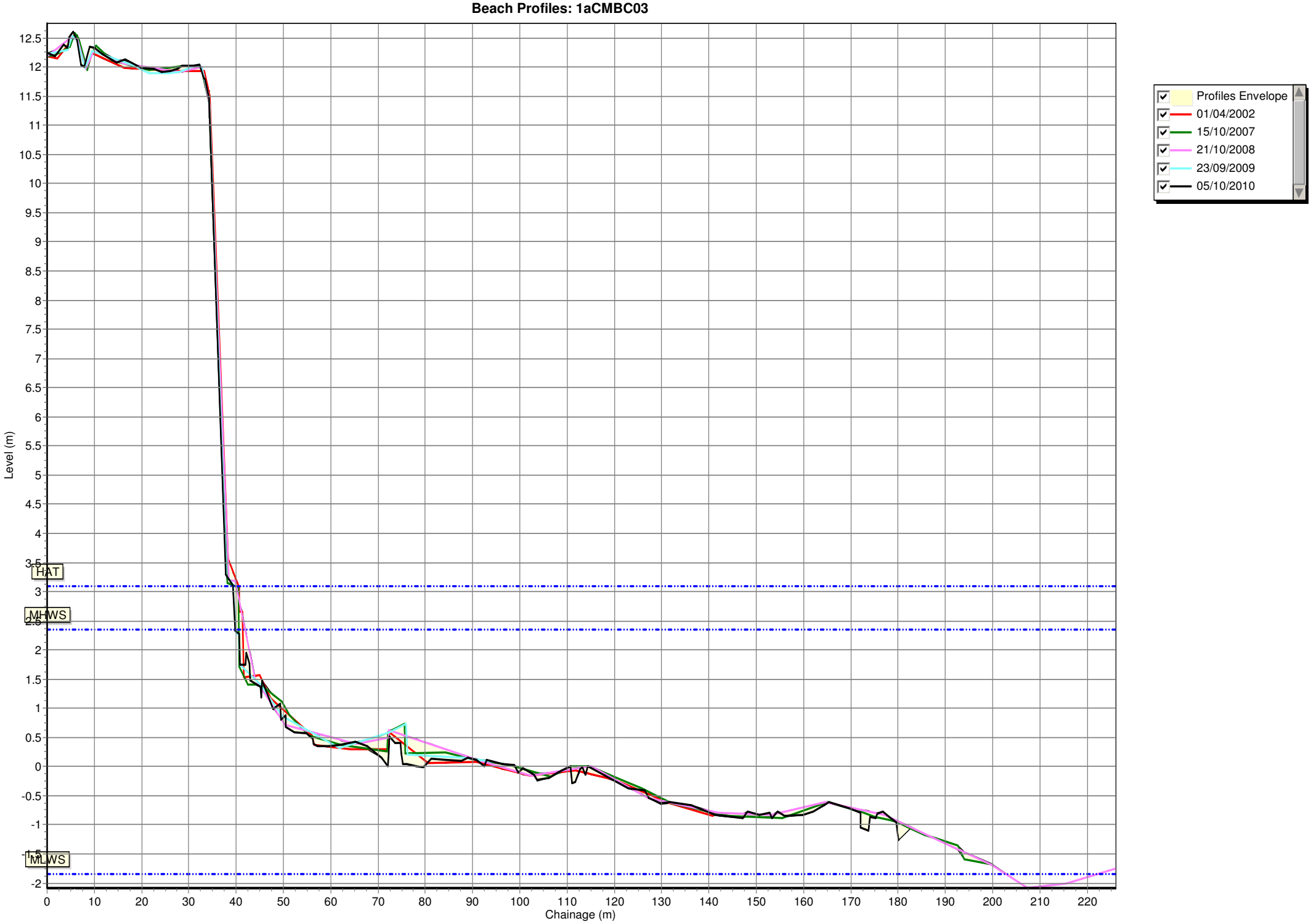
Chainage	Level	Code
-11.487	8.269	M
-10.603	8.288	M
-9.100	8.398	M
-8.050	8.420	M
-7.232	8.354	M
-5.993	8.316	M
-3.907	8.347	M
-2.046	8.583	M
-0.520	8.635	M
0.199	8.994	G
1.207	9.080	G
1.996	9.304	G
3.133	9.373	G
4.330	9.354	G
5.529	9.381	G
6.759	9.574	G
8.013	9.414	G
9.115	9.283	G
9.564	9.356	G
10.113	9.128	G
10.675	6.321	M
11.009	6.219	M
11.953	5.654	M
12.882	5.184	M
13.190	4.849	M
13.645	4.613	M
14.439	3.715	M
15.386	3.400	GS
17.049	3.204	GS
19.186	3.081	GS
21.447	2.703	GS
27.653	2.167	GS
34.642	1.458	GS
40.595	0.747	GS
47.733	-0.107	GS
54.810	-0.993	GS
60.074	-1.626	GS



Beach Profiles: 1aCMBC01




Beach Profiles: 1aCMBC02
Profiles Envelope
01/04/2002
10/03/2009
23/09/2009
01/04/2010
06/10/2010
HAT
MHWS
MLWS
Level (m)
Chainage (m)
11
10.5
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350


Beach Profiles: 1aCMBC03
Profiles Envelope
01/04/2002
15/10/2007
21/10/2008
23/09/2009
05/10/2010
HAT
MHWS
MLWS
Level (m)
Chainage (m)
12.5
12
11.5
11
10.5
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
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1.5
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0.5
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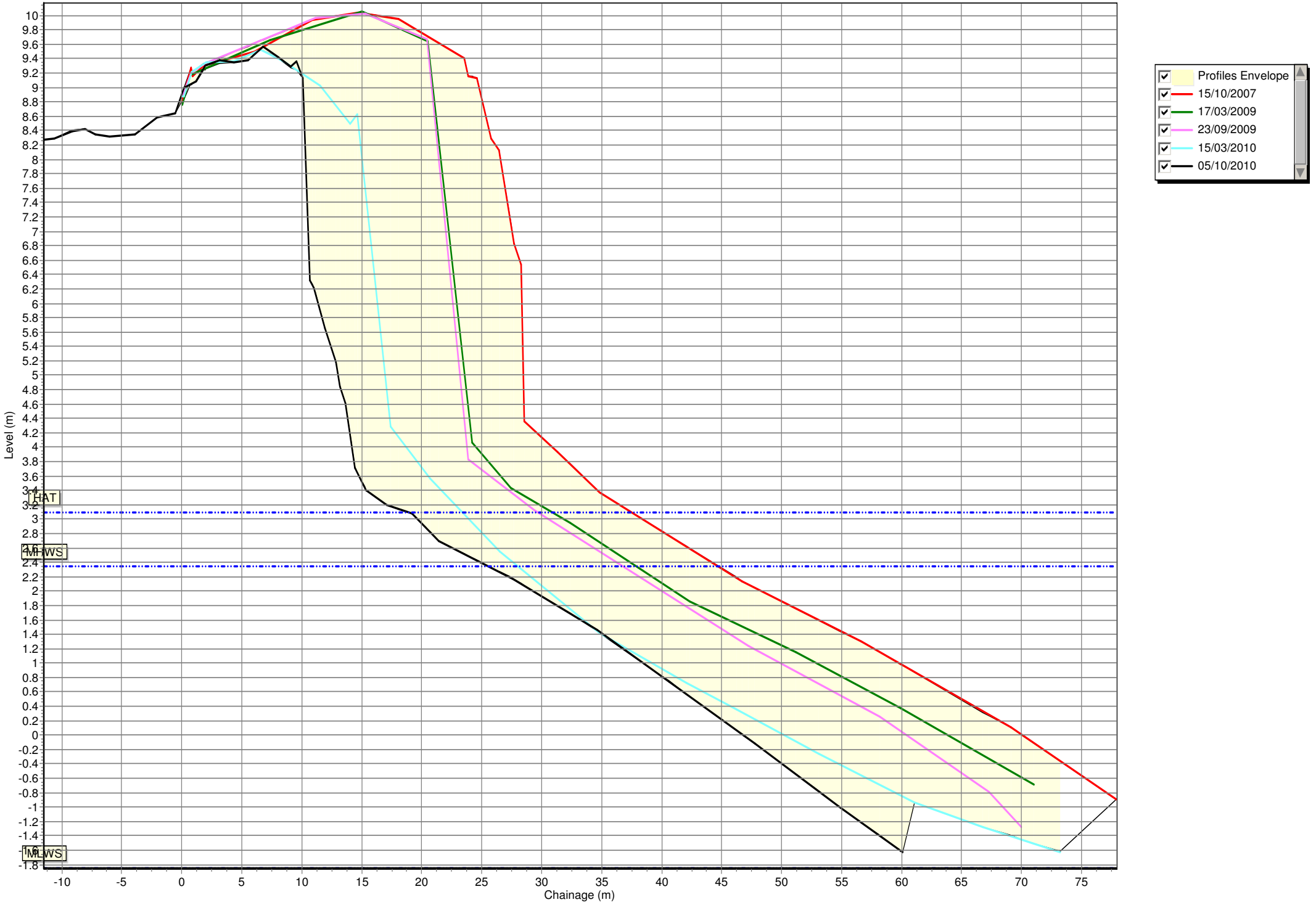
Beach Profiles: 1aCMBC03A

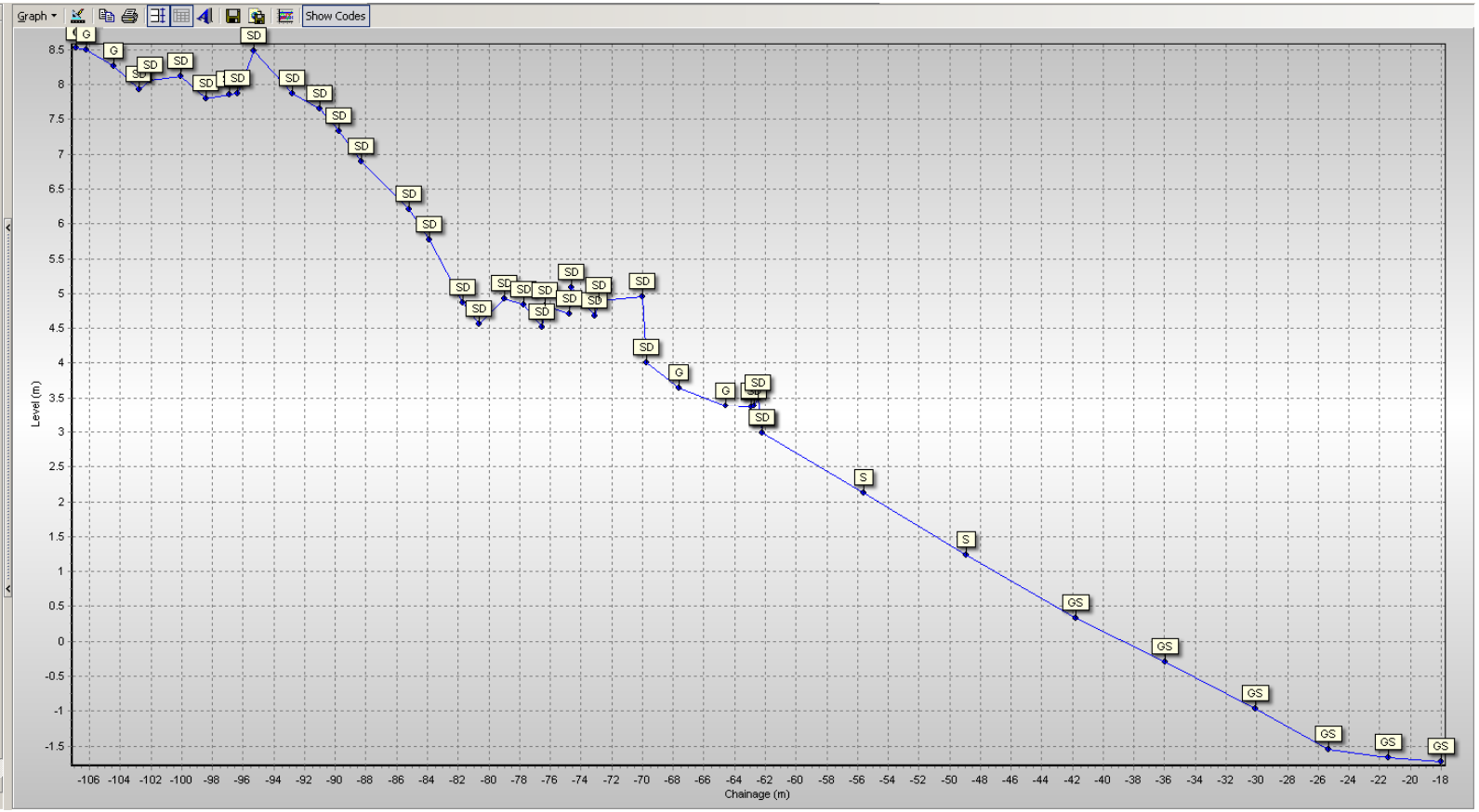
Beach Profiles: 1aCMBC03B



Northumberland CC (Wansbeck)

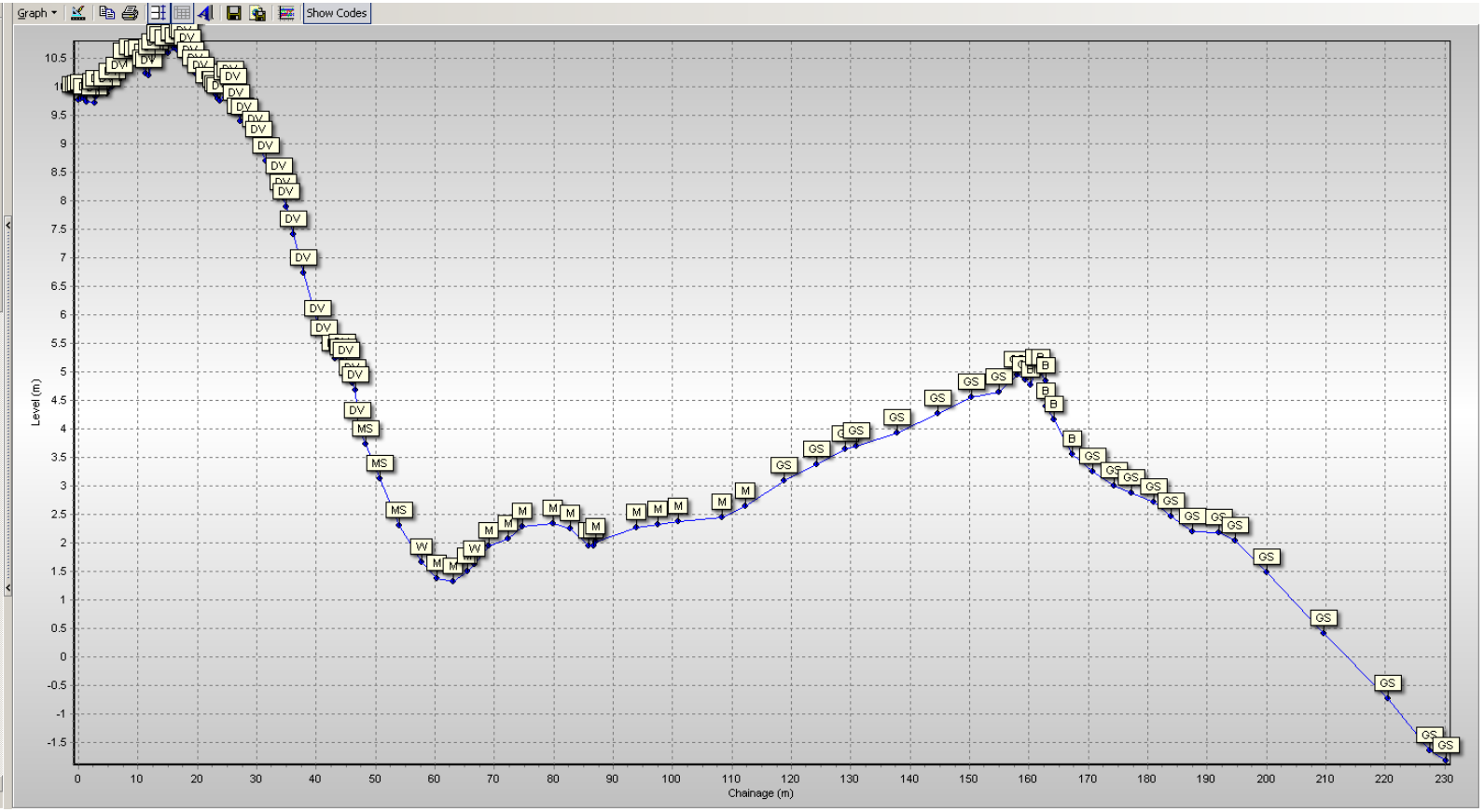
1aWDC01 - 05/10/2010

Chainage	Level	Code
-106.864	8.528	G
-106.233	8.499	G
-104.434	8.263	G
-102.767	7.935	SD
-102.011	8.056	SD
-100.036	8.115	SD
-98.421	7.798	SD
-96.896	7.852	SD
-96.370	7.870	SD
-95.301	8.480	SD
-92.767	7.866	SD
-91.004	7.646	SD
-89.718	7.325	SD
-88.267	6.901	SD
-85.173	6.202	SD
-83.885	5.774	SD
-81.680	4.866	SD
-80.634	4.562	SD
-78.977	4.923	SD
-77.749	4.841	SD
-76.512	4.519	SD
-76.308	4.819	SD
-74.743	4.702	SD
-74.591	5.081	SD
-73.073	4.682	SD
-72.862	4.903	SD
-70.026	4.948	SD
-69.700	4.005	SD
-67.632	3.639	G
-64.556	3.381	G
-62.931	3.371	G
-62.701	3.385	SD
-62.493	3.501	SD
-62.186	2.991	SD
-62.180	2.990	SD
-55.603	2.132	S
-48.916	1.237	S
-41.800	0.337	GS
-35.981	-0.292	GS
-30.077	-0.964	GS
-25.341	-1.550	GS
-21.427	-1.668	GS



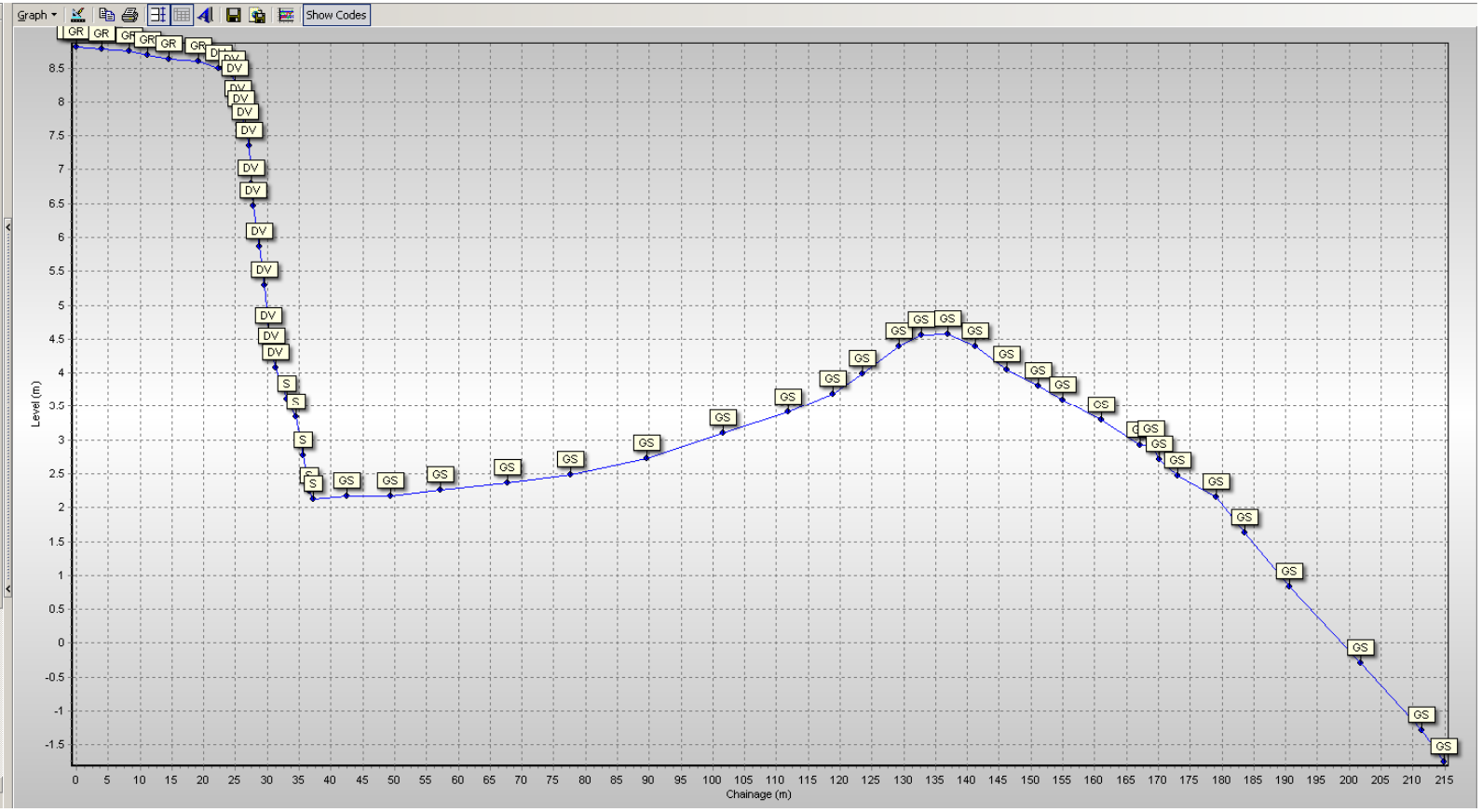
1aWDC02 - 05/10/2010

Chainage	Level	Code
0.000	9.780	
0.030	9.780	DV
0.336	9.797	DV
0.841	9.804	DV
1.327	9.736	DV
2.786	9.716	DV
3.000	9.822	DV
3.452	9.880	DV
4.755	9.886	DV
5.627	10.016	DV
6.848	10.115	DV
8.001	10.368	DV
9.010	10.445	DV
9.860	10.401	DV
10.689	10.425	DV
11.262	10.234	DV
11.773	10.211	DV
12.311	10.444	DV
12.905	10.531	DV
13.657	10.681	DV
14.189	10.649	DV
15.087	10.603	DV
16.129	10.680	DV
16.852	10.631	DV
17.431	10.741	DV
17.861	10.726	DV
18.322	10.598	DV
18.807	10.387	DV
19.761	10.247	DV
20.532	10.113	DV
21.965	9.942	DV
23.120	9.863	DV
23.451	9.797	DV
23.840	9.767	DV
24.965	9.999	DV
25.509	10.051	DV
25.974	9.920	DV
26.611	9.628	DV
27.288	9.401	DV
27.969	9.380	DV
29.770	9.161	DV
30.344	8.998	DV



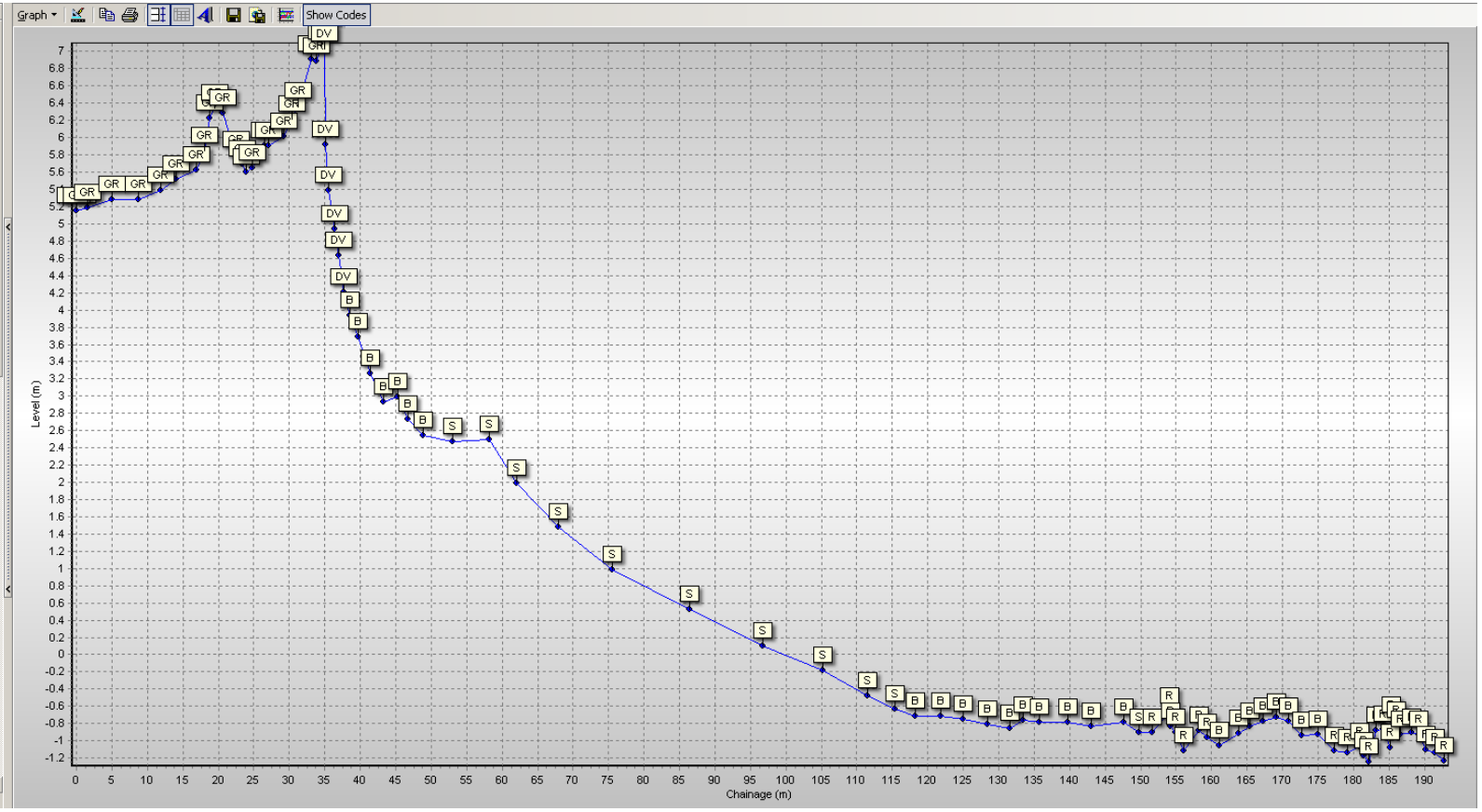
1aWDC03 - 05/10/2010

Chainage	Level	Code
0.000	8.809	
0.020	8.809	GR
4.029	8.783	GR
8.328	8.751	GR
11.141	8.688	GR
14.516	8.627	GR
19.177	8.602	GR
22.298	8.489	DV
24.464	8.407	DV
24.846	8.268	DV
25.395	7.961	DV
25.955	7.813	DV
26.539	7.618	DV
27.137	7.352	DV
27.480	6.803	DV
27.752	6.463	DV
28.773	5.862	DV
29.520	5.289	DV
30.237	4.623	DV
30.734	4.316	DV
31.313	4.083	DV
33.058	3.607	S
34.467	3.343	S
35.615	2.776	S
36.604	2.241	S
37.151	2.129	S
42.451	2.171	GS
49.371	2.165	GS
57.229	2.267	GS
67.797	2.363	GS
77.675	2.485	GS
89.698	2.721	GS
101.590	3.102	GS
111.800	3.410	GS
118.814	3.680	GS
123.457	3.986	GS
129.239	4.387	GS
132.794	4.552	GS
136.898	4.570	GS
141.315	4.394	GS
146.170	4.042	GS
151.079	3.814	GS



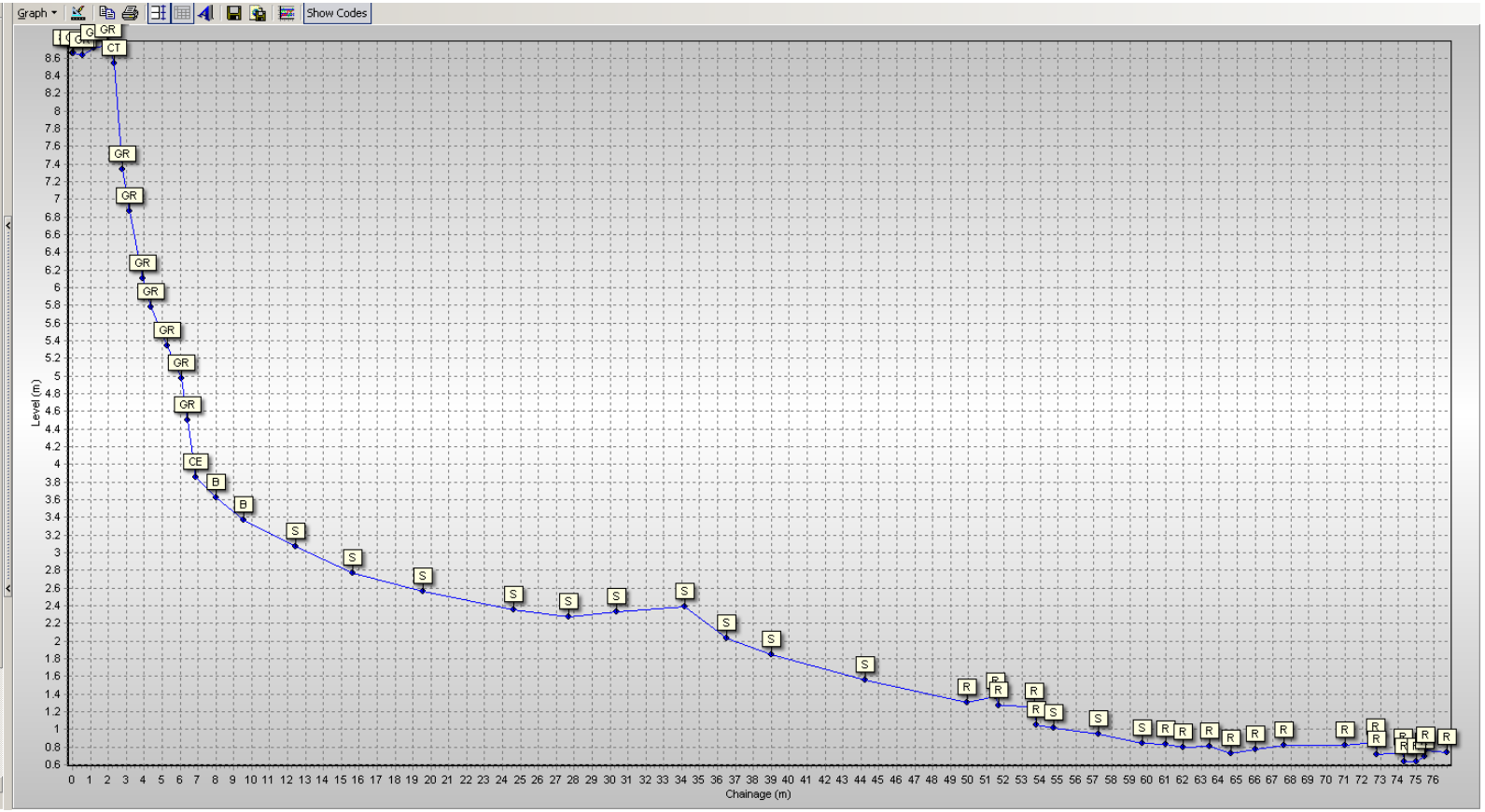
1aWDC04 - 22/09/2010

Chainage	Level	Code
0.000	5.148	
0.016	5.148	GR
1.514	5.193	GR
5.000	5.277	GR
8.692	5.288	GR
11.935	5.385	GR
14.057	5.522	GR
16.884	5.621	GR
18.005	5.853	GR
18.799	6.221	GR
19.532	6.350	GR
20.621	6.284	GR
22.551	5.800	GR
23.338	5.695	GR
23.934	5.596	GR
24.823	5.646	GR
26.477	5.904	GR
27.101	5.904	GR
29.303	6.013	GR
30.415	6.218	GR
31.300	6.368	GR
33.160	6.908	GR
33.773	6.891	GR
34.586	7.053	GR
34.951	7.034	DV
35.174	5.922	DV
35.562	5.390	DV
36.457	4.937	DV
36.971	4.628	DV
37.666	4.205	DV
38.610	3.931	B
39.681	3.693	B
41.420	3.261	B
43.220	2.934	B
45.321	2.988	B
46.754	2.735	B
48.903	2.541	B
52.994	2.473	S
58.236	2.493	S
62.013	1.983	S
67.963	1.481	S
75.516	0.980	S



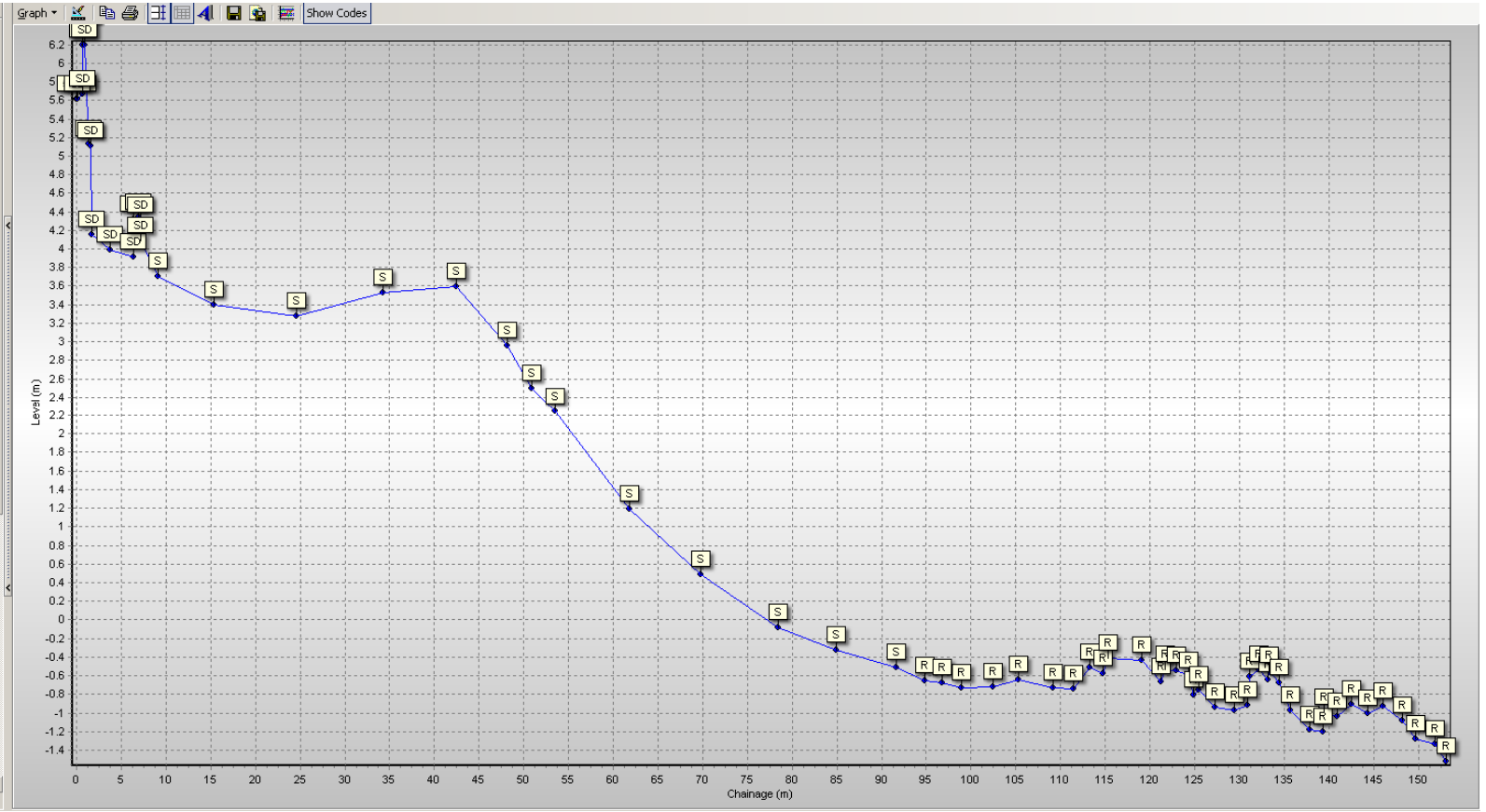
1aWDC05 - 22/09/2010

Chainage	Level	Code
0.000	8.657	
0.031	8.657	GR
0.580	8.634	GR
1.188	8.709	GR
1.976	8.745	GR
2.340	8.541	CT
2.759	7.336	GR
3.210	6.866	GR
3.926	6.103	GR
4.397	5.774	GR
5.262	5.340	GR
6.093	4.966	GR
6.437	4.494	GR
6.880	3.853	CE
7.992	3.625	B
9.573	3.369	B
12.457	3.070	S
15.634	2.771	S
19.583	2.564	S
24.626	2.355	S
27.668	2.267	S
30.377	2.327	S
34.195	2.392	S
36.490	2.025	S
39.014	1.845	S
44.240	1.560	S
49.909	1.298	R
51.547	1.369	R
51.700	1.270	R
53.678	1.260	R
53.790	1.052	R
54.758	1.016	S
57.240	0.942	S
59.736	0.837	S
60.991	0.832	R
61.988	0.793	R
63.438	0.807	R
64.672	0.731	R
65.992	0.769	R
67.608	0.819	R
71.016	0.814	R
72.708	0.856	R



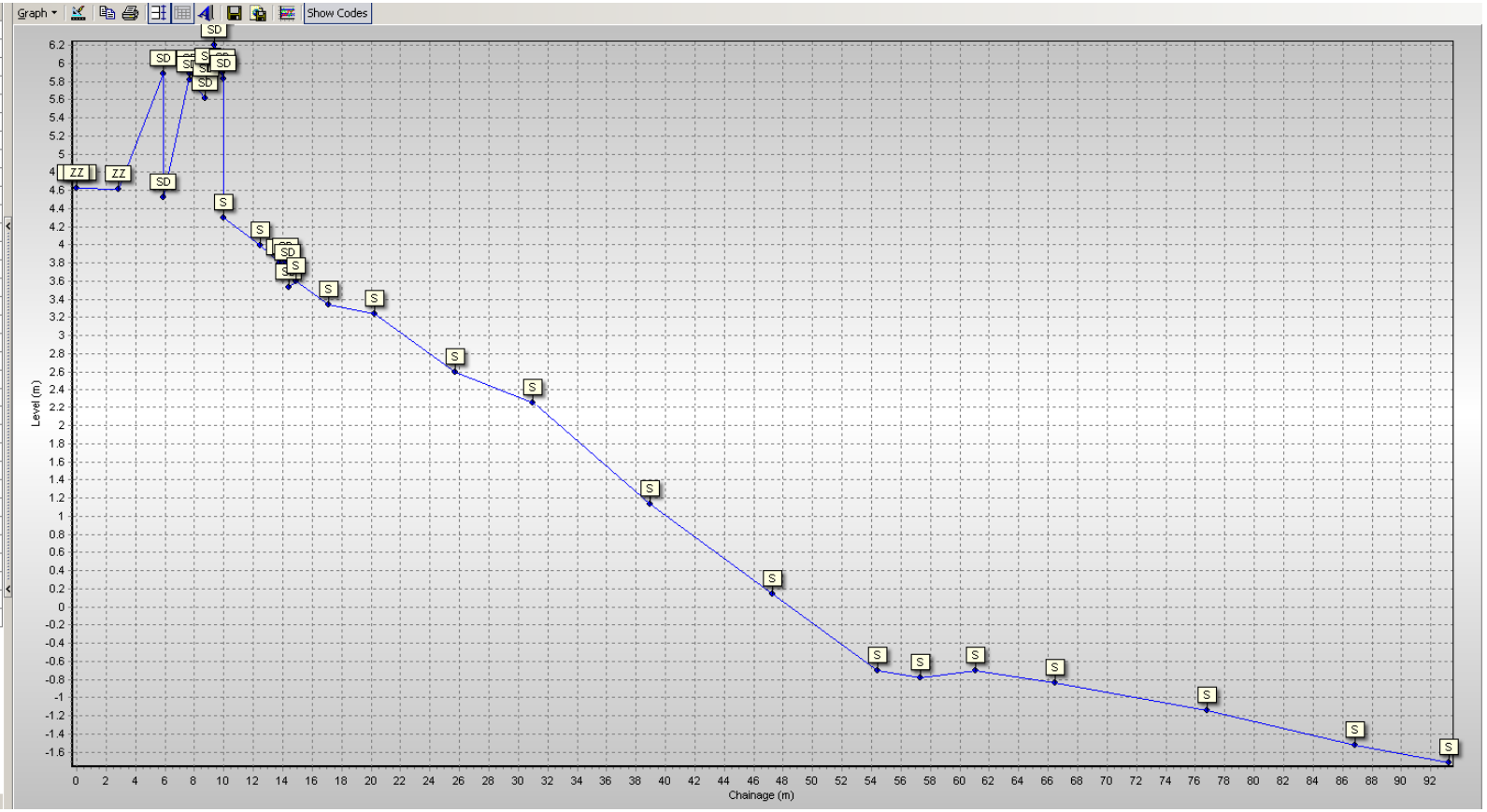
1aWDC05A - 22/09/2010

Chainage	Level	Code
0.000	5.618	
0.098	5.618	SD
0.641	5.664	SD
0.666	6.196	SD
0.874	6.195	SD
1.339	5.126	SD
1.631	5.106	SD
1.655	4.156	SD
3.742	3.995	SD
6.405	3.916	SD
6.424	4.322	SD
6.977	4.342	SD
7.123	4.305	SD
7.226	4.092	SD
9.088	3.704	S
15.325	3.394	S
24.572	3.273	S
34.259	3.526	S
42.511	3.599	S
48.193	2.957	S
50.914	2.496	S
53.549	2.243	S
61.868	1.185	S
69.799	0.486	S
78.475	-0.086	S
84.907	-0.321	S
91.632	-0.511	S
94.784	-0.654	R
96.737	-0.678	R
98.988	-0.726	R
102.500	-0.716	R
105.364	-0.642	R
109.138	-0.726	R
111.462	-0.744	R
113.312	-0.511	R
114.810	-0.581	R
115.352	-0.416	R
119.032	-0.437	R
121.196	-0.666	R
121.676	-0.538	R
122.996	-0.545	R
124.281	-0.599	R



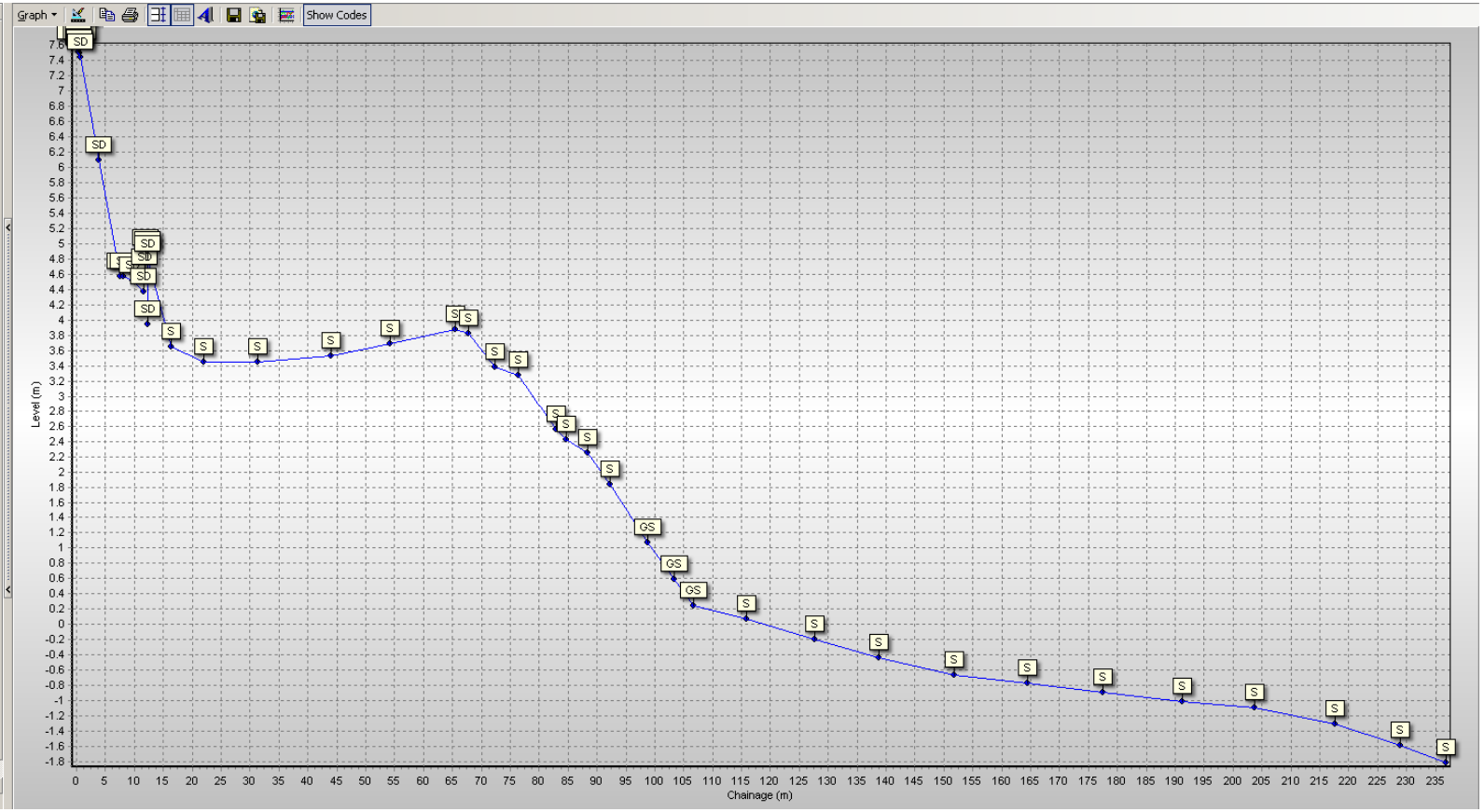
1aWDC06 - 22/09/2010

Chainage	Level	Code
0.000	4.629	
0.008	4.629	ZZ
2.857	4.615	ZZ
5.858	5.883	SD
5.870	4.526	SD
7.672	5.880	SD
7.678	5.814	SD
8.705	5.615	SD
8.769	5.775	SD
8.929	5.905	SD
9.351	6.201	SD
9.896	5.900	SD
9.970	5.828	SD
9.989	4.300	S
12.445	3.993	S
13.820	3.804	SD
14.236	3.809	SD
14.323	3.751	SD
14.391	3.535	SD
14.883	3.600	S
17.136	3.344	S
20.210	3.244	S
25.712	2.596	S
31.010	2.264	S
38.942	1.136	S
47.302	0.139	S
54.412	-0.708	S
57.296	-0.786	S
61.100	-0.705	S
66.503	-0.834	S
76.771	-1.146	S
86.886	-1.522	S
93.230	-1.717	S



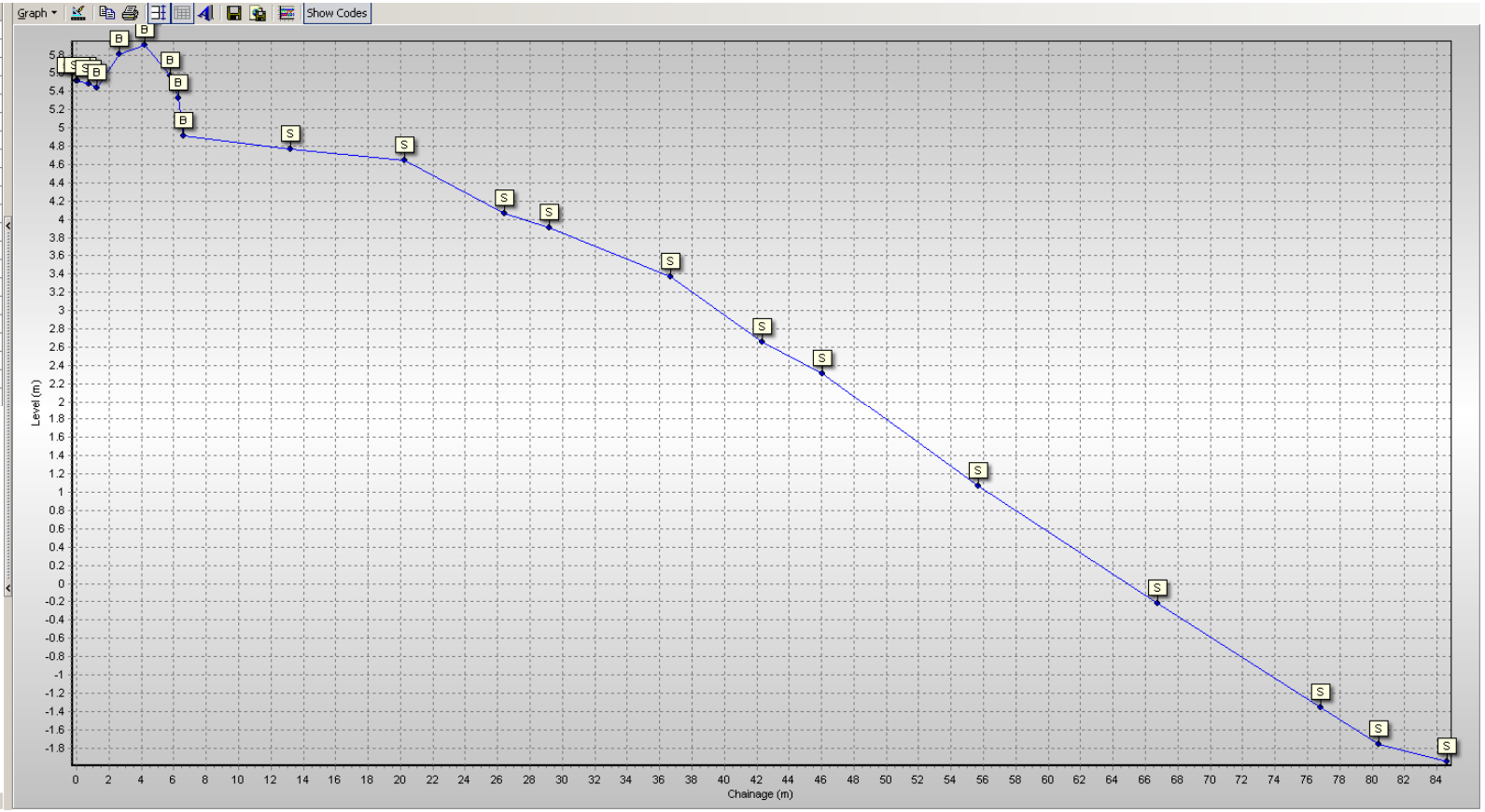
1aWDC06A - 22/09/2010

Chainage	Level	Code
0.000	7.571	
0.064	7.571	SD
0.395	7.562	SD
0.433	7.504	SD
0.593	7.488	SD
0.644	7.443	SD
3.945	6.085	SD
7.508	4.570	SD
8.027	4.571	SD
9.699	4.513	SD
11.639	4.375	SD
11.737	4.628	SD
11.923	4.870	SD
12.244	4.850	SD
12.285	3.939	SD
12.322	4.800	SD
16.426	3.649	S
21.926	3.448	S
31.369	3.452	S
44.094	3.526	S
54.179	3.688	S
65.442	3.878	S
67.812	3.820	S
72.300	3.388	S
76.425	3.279	S
82.939	2.558	S
84.735	2.425	S
88.449	2.241	S
92.247	1.828	S
98.863	1.067	GS
103.365	0.587	GS
106.673	0.245	GS
115.903	0.079	S
127.689	-0.201	S
138.746	-0.430	S
151.761	-0.657	S
164.390	-0.766	S
177.451	-0.891	S
191.221	-1.009	S
203.714	-1.091	S
217.617	-1.300	S
228.958	-1.584	S



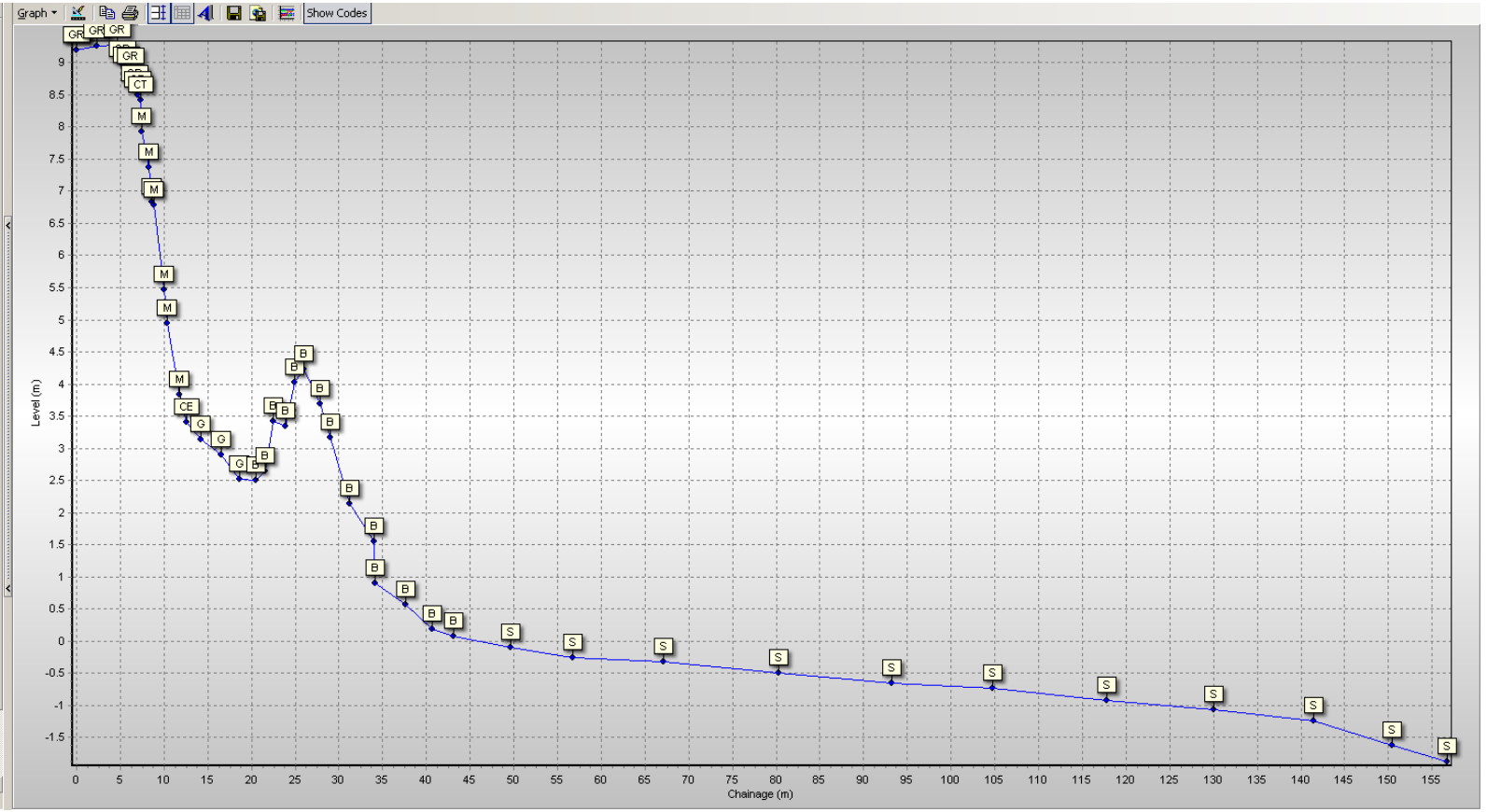
1aWDC07 - 22/09/2010

Chainage	Level	Code
0.000	5.517	
0.082	5.517	SD
0.775	5.486	SD
1.288	5.440	B
2.618	5.808	B
4.201	5.907	B
5.791	5.576	B
6.294	5.325	B
6.622	4.912	B
13.186	4.768	S
20.263	4.642	S
26.398	4.061	S
29.173	3.907	S
36.664	3.366	S
42.314	2.653	S
46.025	2.308	S
55.680	1.063	S
66.774	-0.216	S
76.824	-1.354	S
80.404	-1.757	S
84.622	-1.950	S



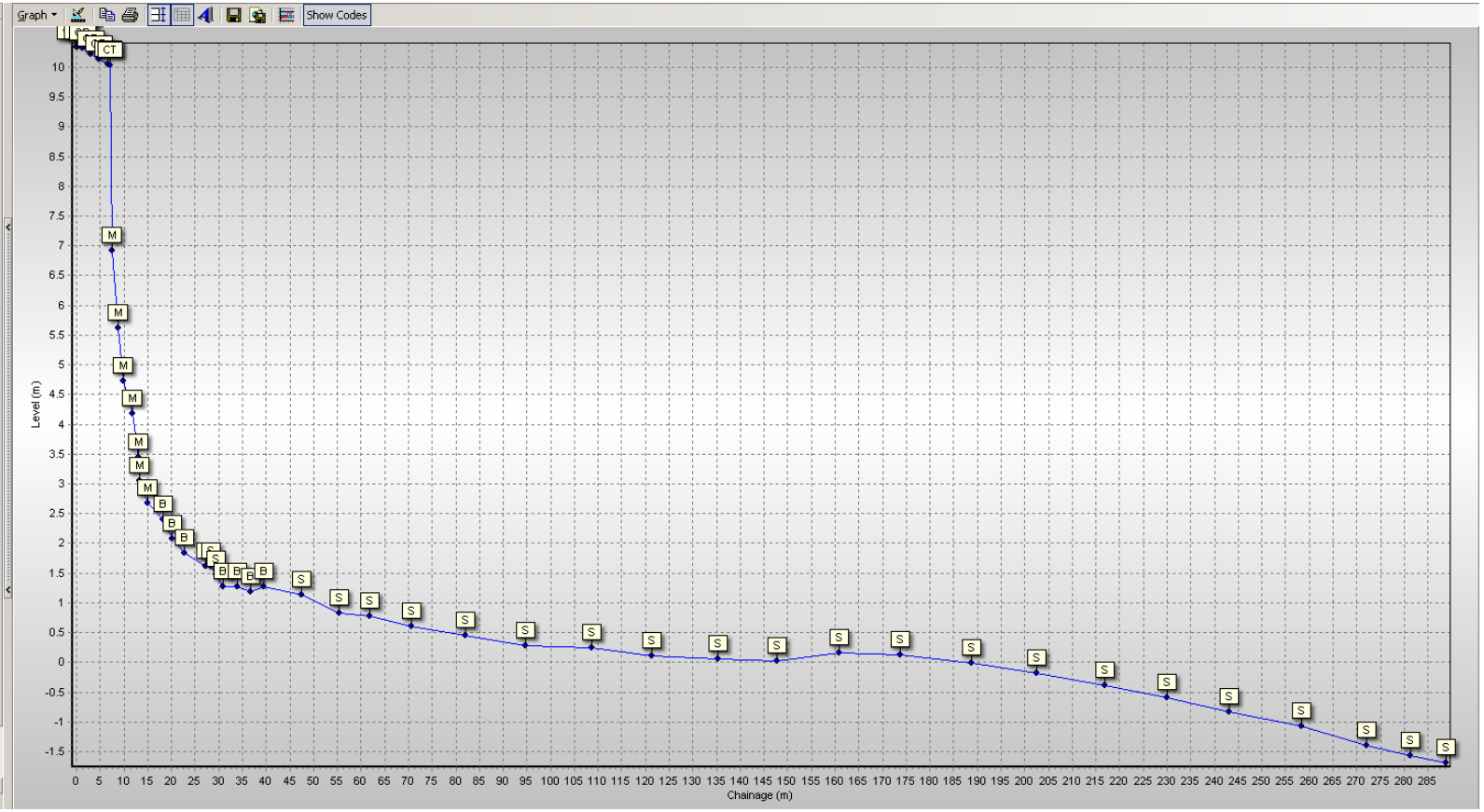
1aWDC08 - 22/09/2010

Chainage	Level	Code
0.000	9.200	
0.046	9.200	GR
2.277	9.263	GR
4.664	9.273	GR
5.203	8.975	GR
5.692	8.880	GR
6.233	8.865	GR
6.655	8.587	GR
6.982	8.496	GR
7.297	8.414	CT
7.491	7.929	M
8.266	7.364	M
8.604	6.825	M
8.811	6.779	M
10.000	5.460	M
10.419	4.942	M
11.789	3.839	M
12.547	3.413	CE
14.172	3.145	G
16.577	2.893	G
18.642	2.514	G
20.456	2.500	B
21.553	2.641	B
22.464	3.424	B
23.903	3.346	B
24.962	4.026	B
25.999	4.237	B
27.814	3.699	B
28.981	3.176	B
31.214	2.133	B
33.968	1.557	B
34.179	0.903	B
37.637	0.572	B
40.680	0.189	B
43.146	0.074	B
49.671	-0.094	S
56.755	-0.257	S
67.075	-0.319	S
80.229	-0.491	S
93.169	-0.652	S
104.727	-0.735	S
117.840	-0.925	S



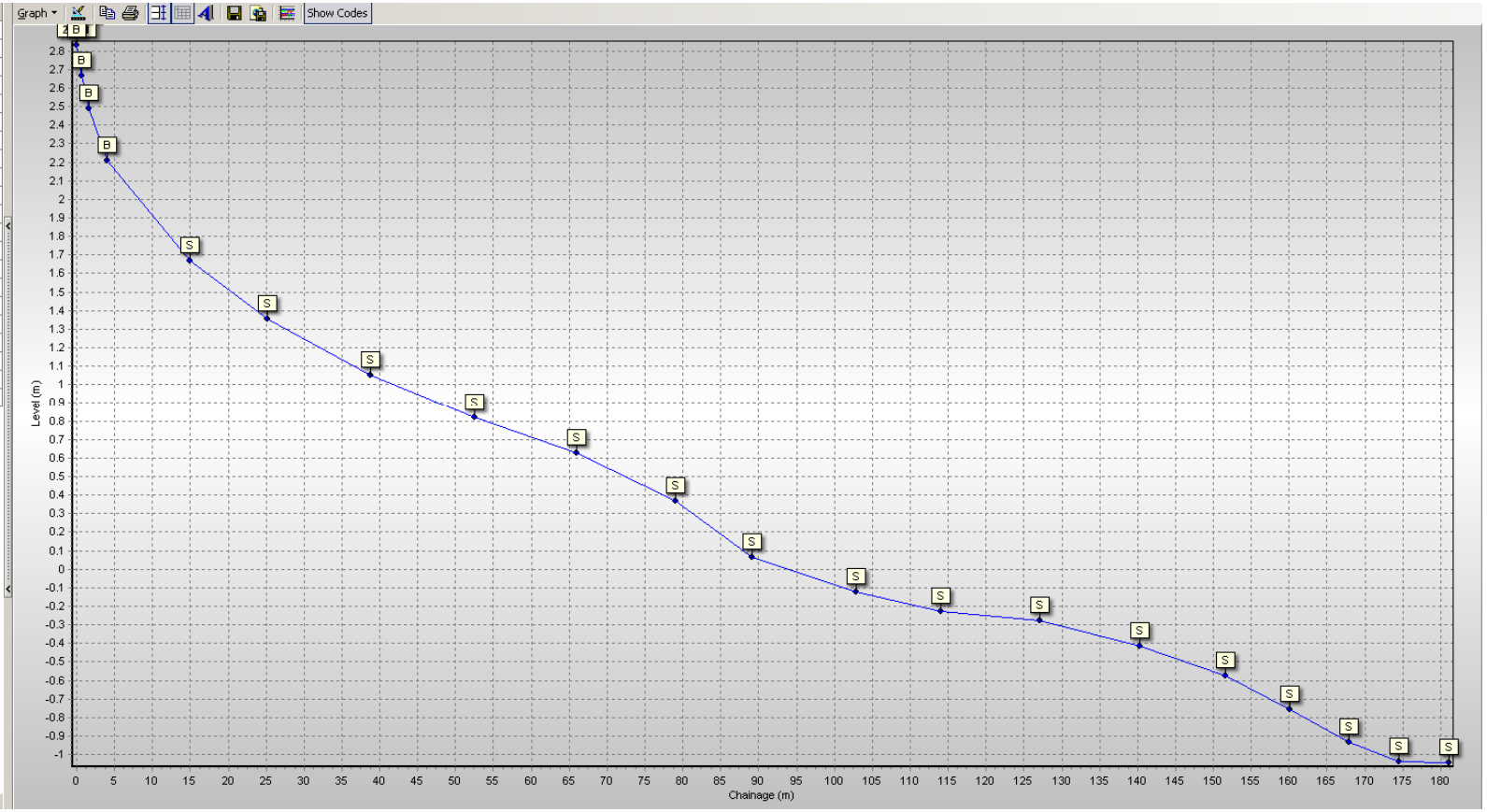
1aWDC09 - 22/09/2010

Chainage	Level	Code
0.000	10.340	
0.113	10.340	GR
1.338	10.317	GR
3.037	10.220	GR
4.780	10.135	GR
6.597	10.048	GR
7.066	10.036	CT
7.602	6.916	M
8.857	5.620	M
9.773	4.721	M
11.763	4.177	M
13.139	3.446	M
13.297	3.052	M
15.011	2.669	M
18.291	2.403	B
20.207	2.074	B
22.696	1.831	B
27.226	1.617	B
28.285	1.611	S
29.338	1.476	S
30.995	1.273	B
33.888	1.277	B
36.783	1.178	B
39.557	1.268	B
47.461	1.142	S
55.354	0.825	S
61.808	0.776	S
70.735	0.609	S
82.097	0.450	S
94.613	0.288	S
108.676	0.251	S
121.369	0.113	S
135.371	0.061	S
147.681	0.020	S
160.877	0.156	S
173.645	0.131	S
188.749	-0.017	S
202.566	-0.185	S
216.999	-0.386	S
230.065	-0.598	S
243.083	-0.824	S
258.429	-1.074	S



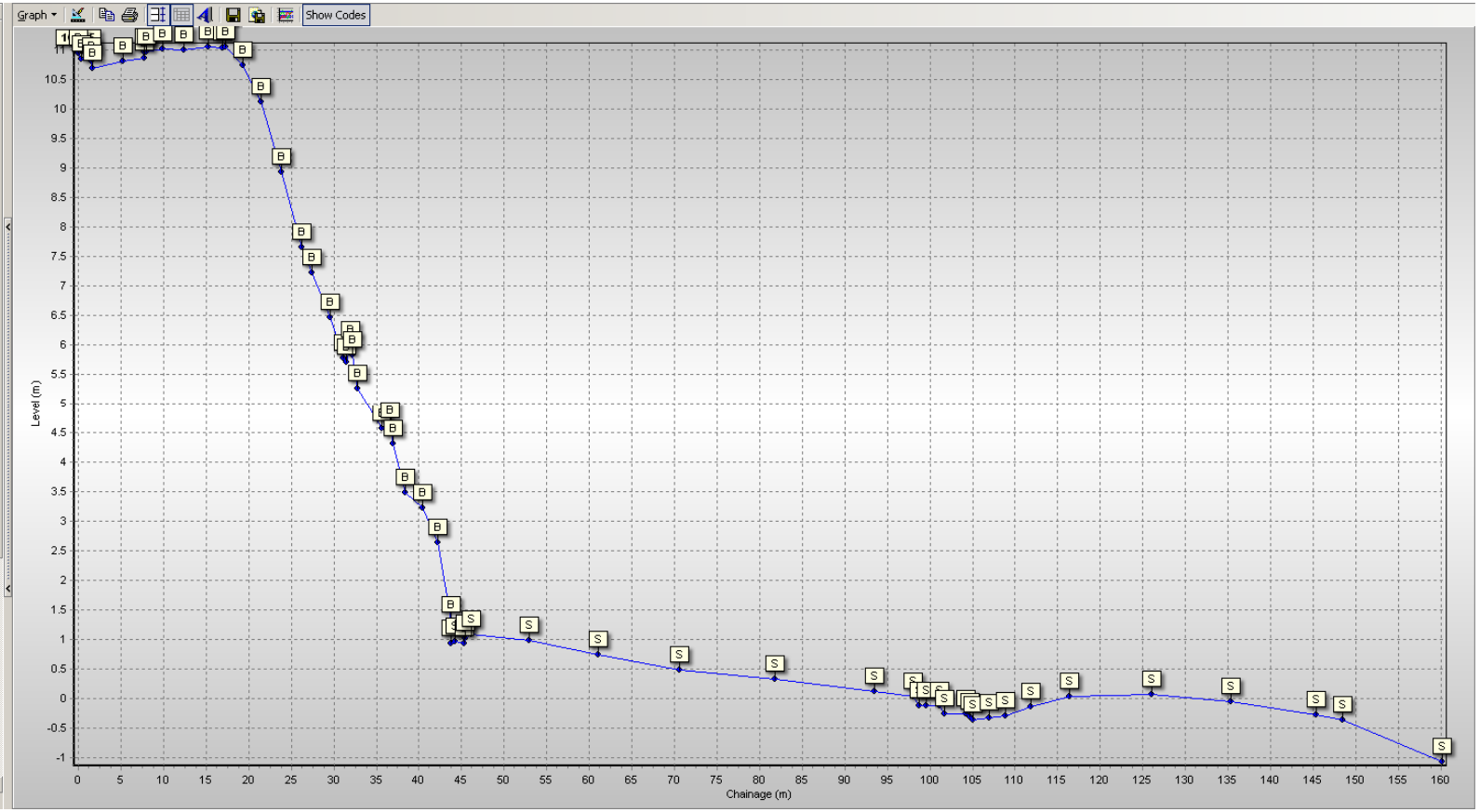
1aWDC10 - 22/09/2010

Chainage	Level	Code
0.000	2.831	
0.045	2.831	B
0.641	2.666	B
1.603	2.489	B
3.989	2.206	B
14.997	1.669	S
25.157	1.353	S
38.761	1.053	S
52.516	0.817	S
66.036	0.627	S
78.968	0.366	S
89.138	0.063	S
102.827	-0.121	S
113.984	-0.230	S
127.068	-0.277	S
140.362	-0.414	S
151.538	-0.576	S
160.118	-0.759	S
167.907	-0.933	S
174.537	-1.035	S
181.091	-1.043	S



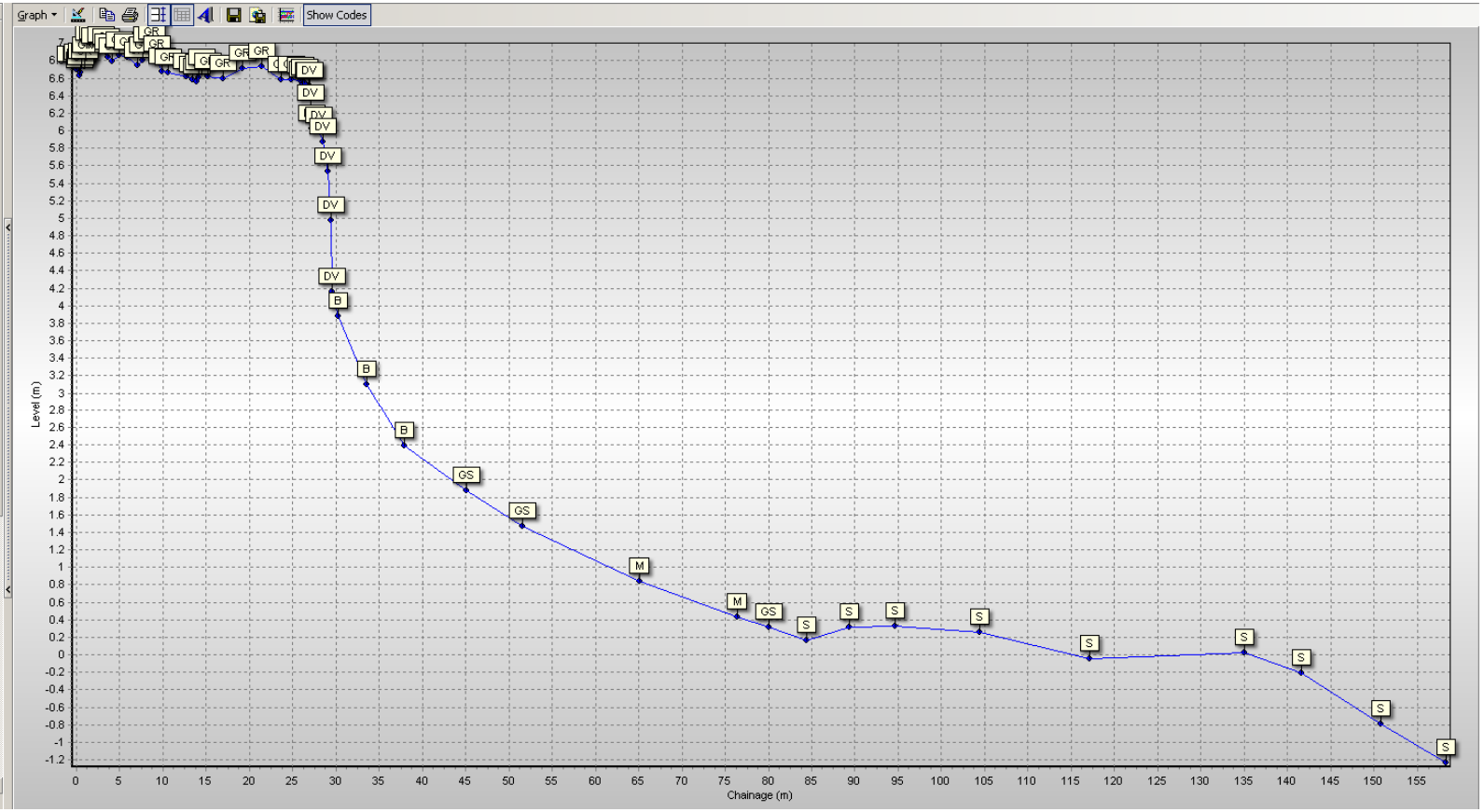
1aWDC11 - 22/09/2010

Chainage	Level	Code
0.000	10.945	
0.040	10.945	B
0.317	10.841	B
1.591	10.802	B
1.644	10.691	B
5.241	10.804	B
7.789	10.858	B
7.809	10.962	B
7.958	10.960	B
9.934	11.005	B
12.455	10.995	B
15.240	11.048	B
16.952	11.023	B
17.271	11.045	B
19.302	10.739	B
21.451	10.125	B
23.810	8.933	B
26.188	7.656	B
27.465	7.226	B
29.537	6.462	B
31.115	5.769	B
31.520	5.702	B
31.964	6.004	B
32.202	5.820	B
32.791	5.265	B
35.636	4.569	B
36.603	4.624	B
36.914	4.318	B
38.374	3.482	B
40.457	3.232	B
42.251	2.646	B
43.707	1.336	B
43.732	0.927	B
44.298	0.962	S
45.255	0.935	S
45.466	1.030	S
46.206	1.090	S
52.926	0.987	S
61.032	0.751	S
70.538	0.489	S
81.802	0.331	S
93.485	0.130	S



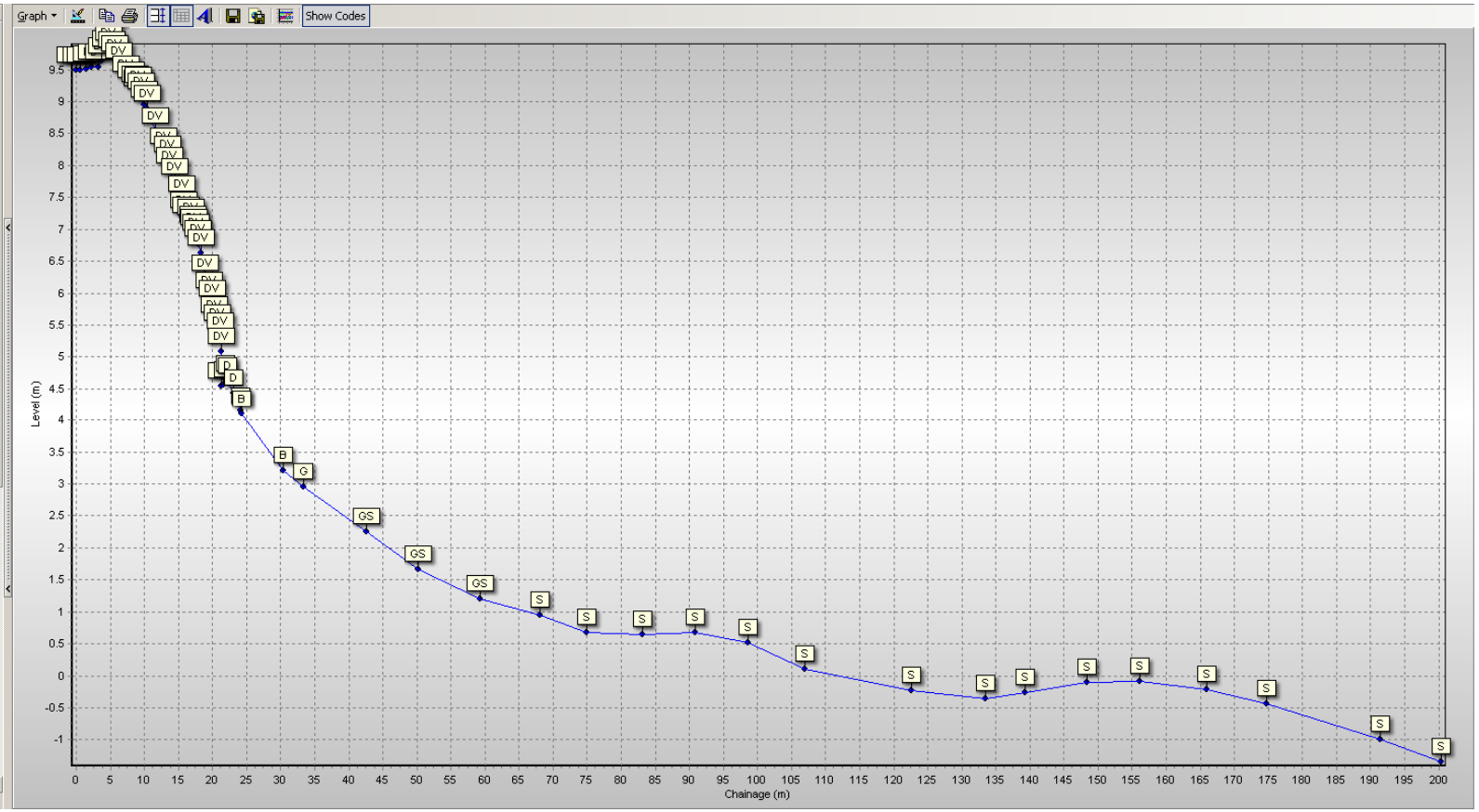
1aWDC12 - 22/09/2010

Chainage	Level	Code
0.000	6.698	
0.015	6.698	GR
0.133	6.726	GR
0.338	6.624	GR
0.489	6.667	GR
0.615	6.739	GR
0.973	6.731	GR
1.095	6.806	GR
1.458	6.943	GR
1.844	6.953	GR
2.171	6.904	GR
2.781	6.918	GR
3.373	6.895	GR
3.629	6.840	GR
4.146	6.798	GR
4.911	6.865	GR
5.912	6.842	GR
7.110	6.749	GR
7.598	6.801	GR
8.109	6.924	GR
8.700	6.956	GR
9.338	6.819	GR
9.921	6.681	GR
10.601	6.659	GR
12.668	6.621	GR
13.426	6.586	GR
13.845	6.558	GR
14.086	6.608	GR
14.516	6.666	GR
15.245	6.623	GR
16.955	6.594	GR
19.233	6.710	GR
21.431	6.734	GR
23.661	6.586	GR
24.857	6.580	GR
25.917	6.567	GR
26.116	6.529	GR
26.425	6.551	DV
26.785	6.514	DV
26.967	6.512	DV
27.100	6.252	DV
27.205	6.024	DV



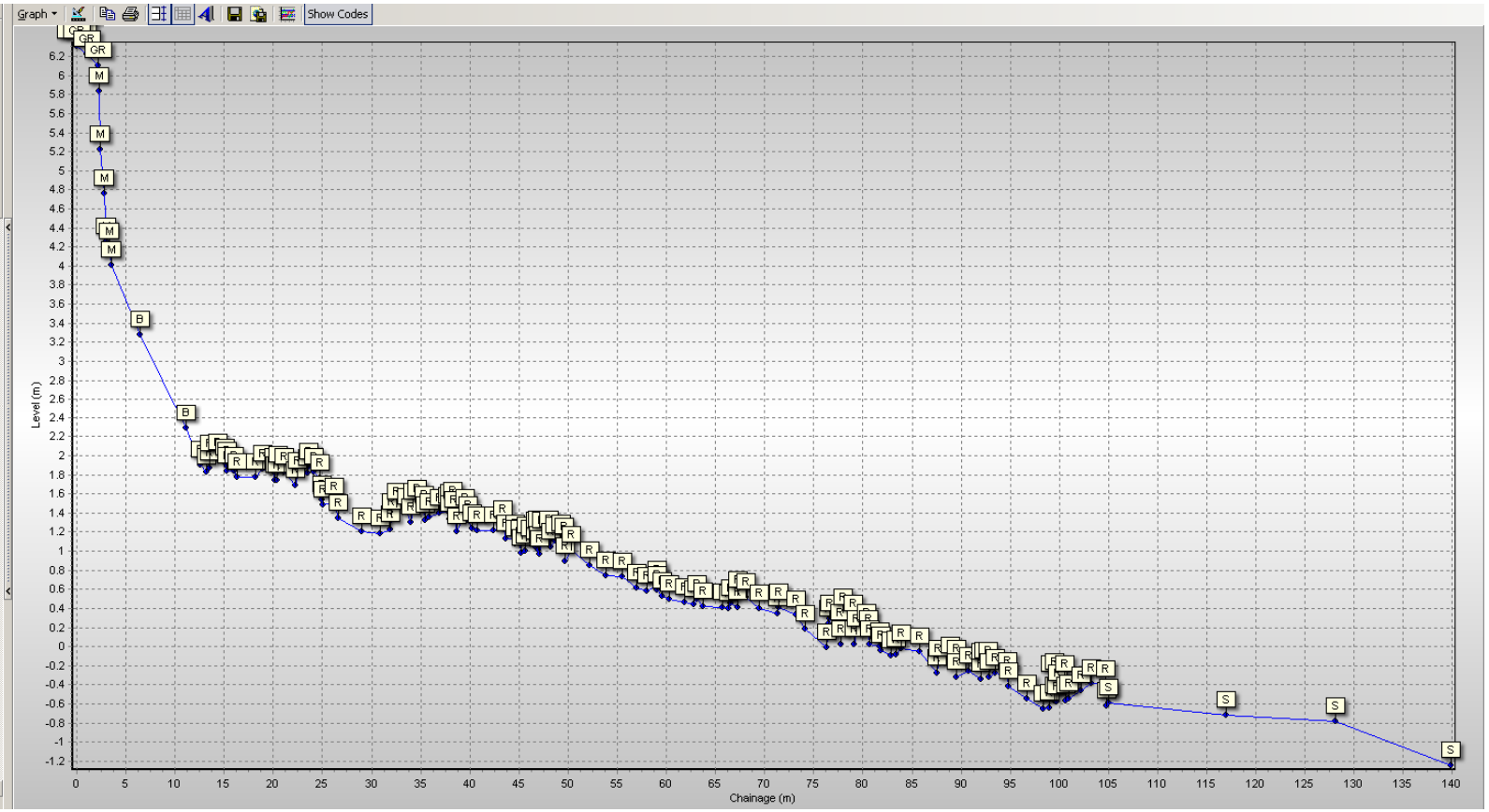
1aWDC13 - 22/09/2010

Chainage	Level	Code
0.000	9.489	
0.015	9.489	DV
0.638	9.496	DV
1.444	9.507	DV
2.249	9.542	DV
3.346	9.544	DV
3.754	9.645	DV
4.380	9.756	DV
4.768	9.844	DV
5.187	9.732	DV
5.604	9.672	DV
6.277	9.556	DV
7.348	9.353	DV
8.065	9.250	DV
8.659	9.190	DV
8.919	9.134	DV
9.057	9.177	DV
9.564	9.073	DV
10.020	8.952	DV
10.483	8.882	DV
11.689	8.541	DV
12.873	8.223	DV
13.428	8.090	DV
13.746	7.925	DV
14.473	7.747	DV
15.458	7.467	DV
15.815	7.226	DV
16.076	7.146	DV
16.897	7.114	DV
17.159	7.001	DV
17.314	6.940	DV
17.590	6.874	DV
17.867	6.771	DV
18.285	6.630	DV
18.979	6.225	DV
19.518	5.957	DV
19.937	5.827	DV
20.259	5.582	DV
20.766	5.458	DV
21.151	5.326	DV
21.270	5.080	DV
21.366	4.538	DV



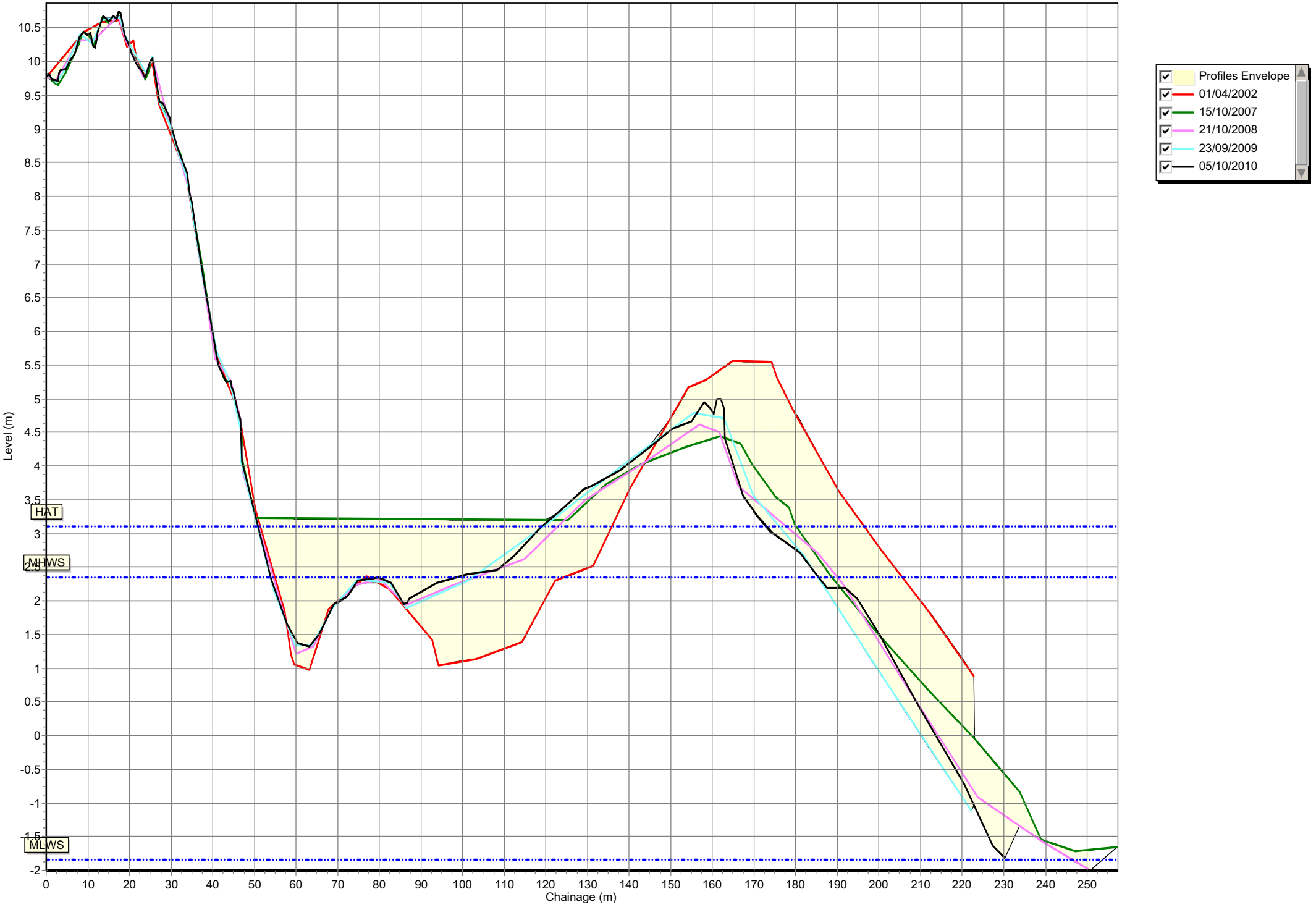
1aWDC14 - 22/09/2010

Chainage	Level	Code
0.000	6.309	
0.014	6.309	GR
1.014	6.223	GR
2.206	6.106	GR
2.334	5.834	M
2.442	5.226	M
2.773	4.758	M
3.031	4.255	M
3.286	4.198	M
3.523	4.006	M
6.437	3.281	B
11.135	2.289	B
12.629	1.899	B
13.163	1.833	R
13.515	1.867	R
13.566	1.970	R
14.297	1.978	R
15.052	1.920	R
15.274	1.890	R
15.330	1.840	R
16.004	1.834	R
16.285	1.770	R
18.192	1.774	R
18.922	1.860	R
20.091	1.828	R
20.172	1.738	R
20.402	1.745	R
20.463	1.853	R
21.090	1.830	R
22.239	1.692	R
22.439	1.790	R
23.470	1.817	R
23.579	1.882	R
24.143	1.832	R
24.773	1.759	R
24.929	1.536	R
25.089	1.486	R
26.195	1.516	R
26.573	1.349	R
28.988	1.202	R
30.903	1.184	R
31.950	1.226	R

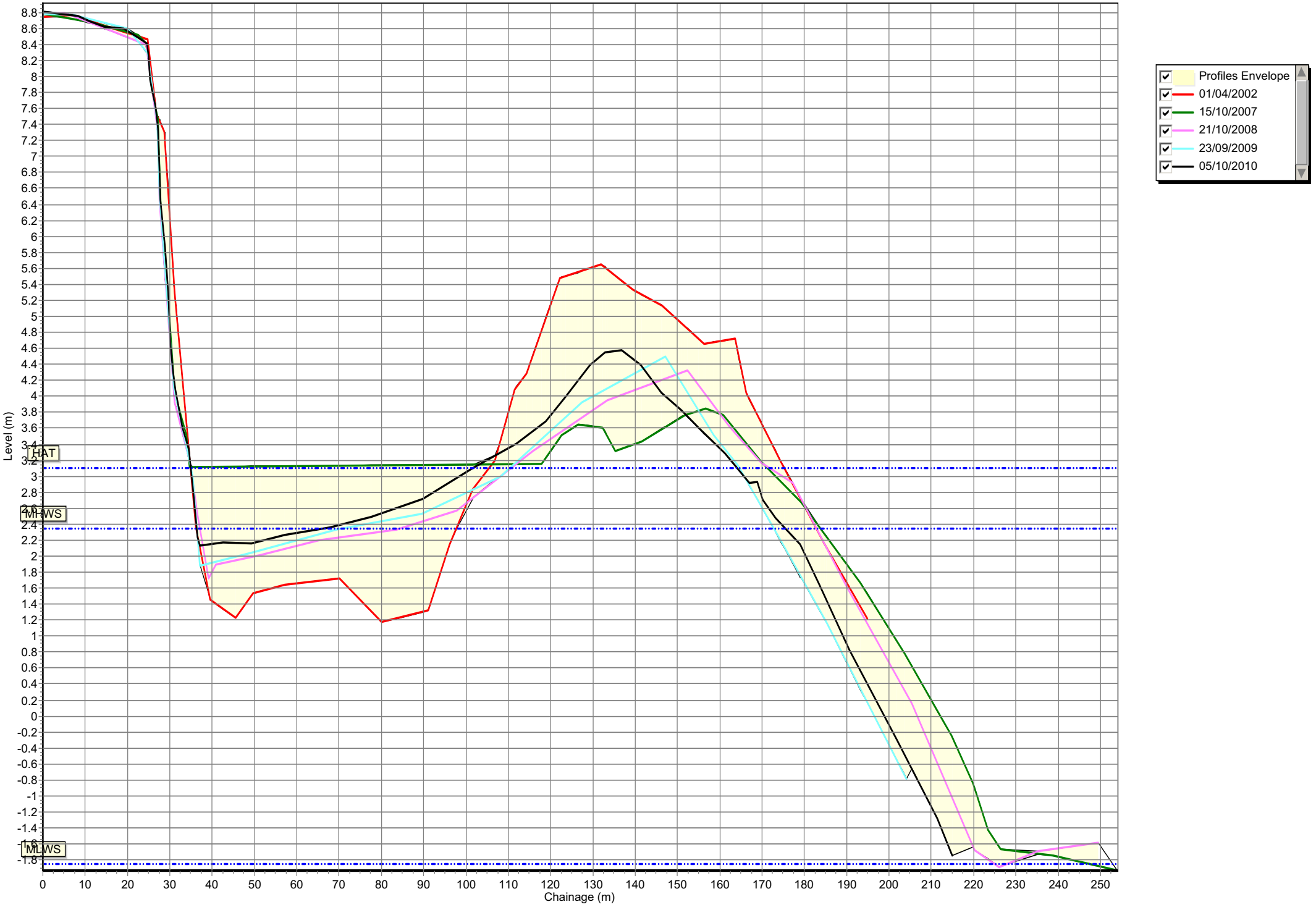


Beach Profiles: 1aWDC01

Beach Profiles: 1aWDC02

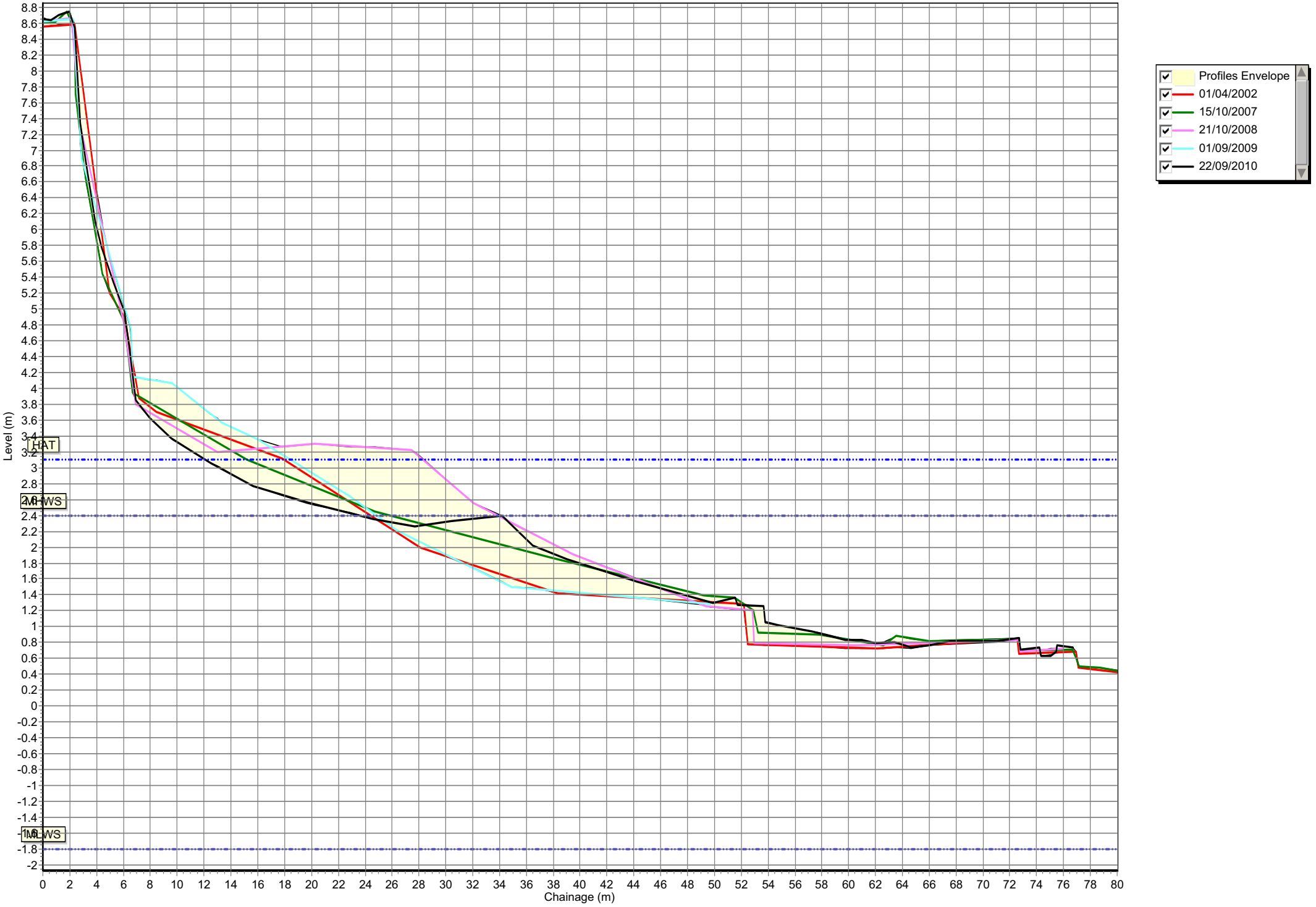


Beach Profiles: 1aWDC03

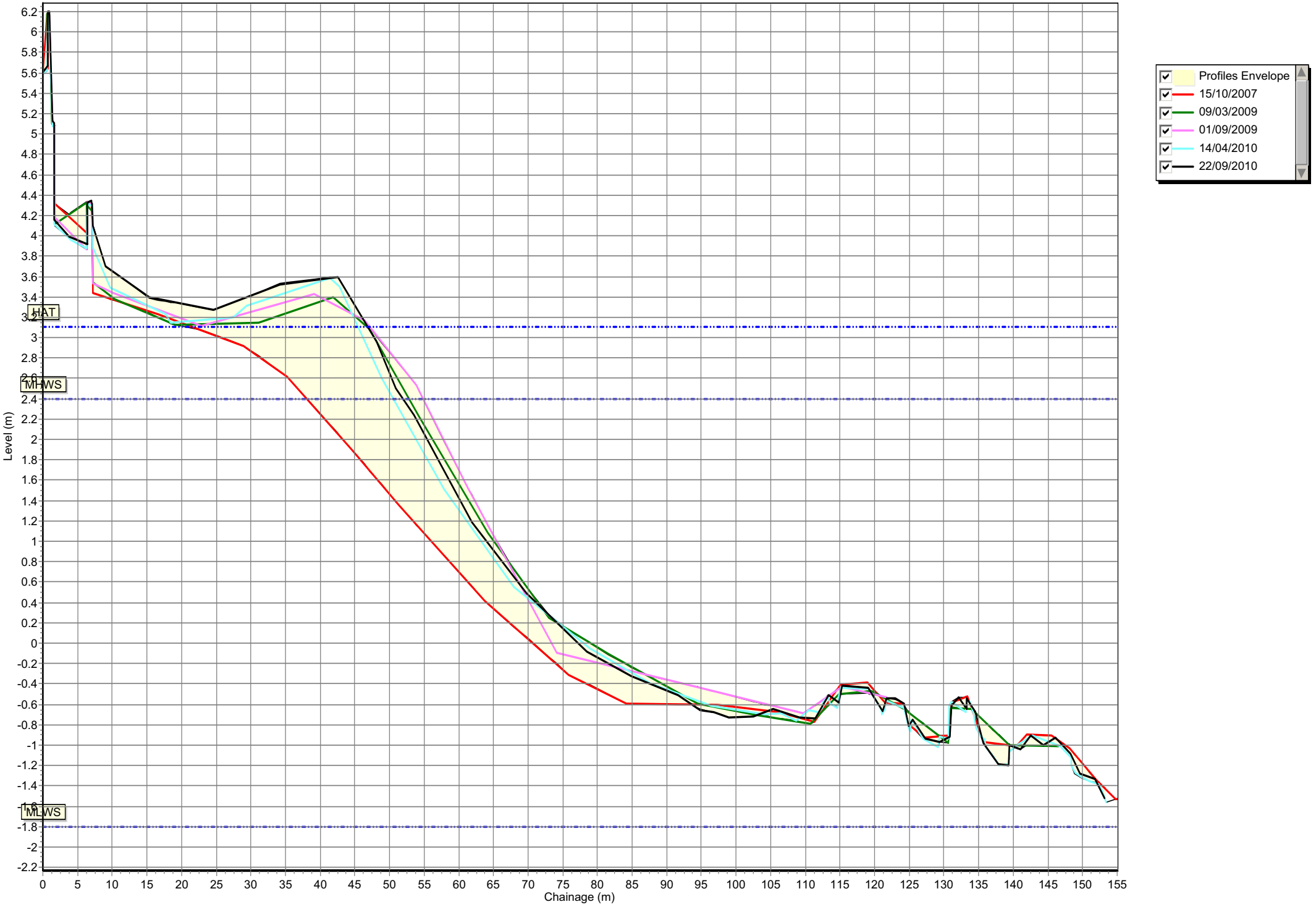



Beach Profiles: 1aWDC04
Profiles Envelope
01/04/2002
15/10/2007
21/10/2008
01/09/2009
22/09/2010
HAT
MHWS
MLWS
Level (m)
Chainage (m)

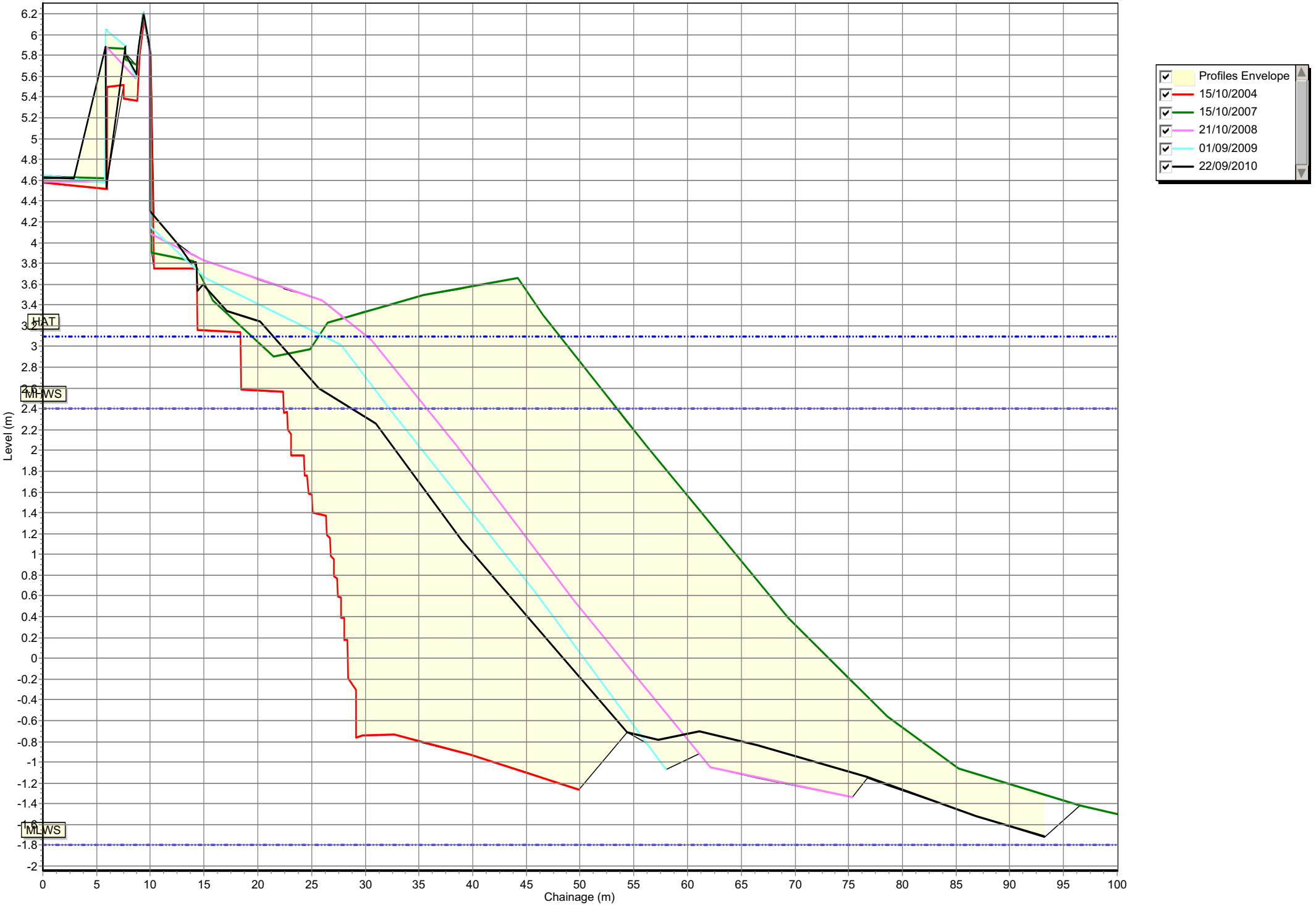
Beach Profiles: 1aWDC05



Beach Profiles: 1aWDC05A

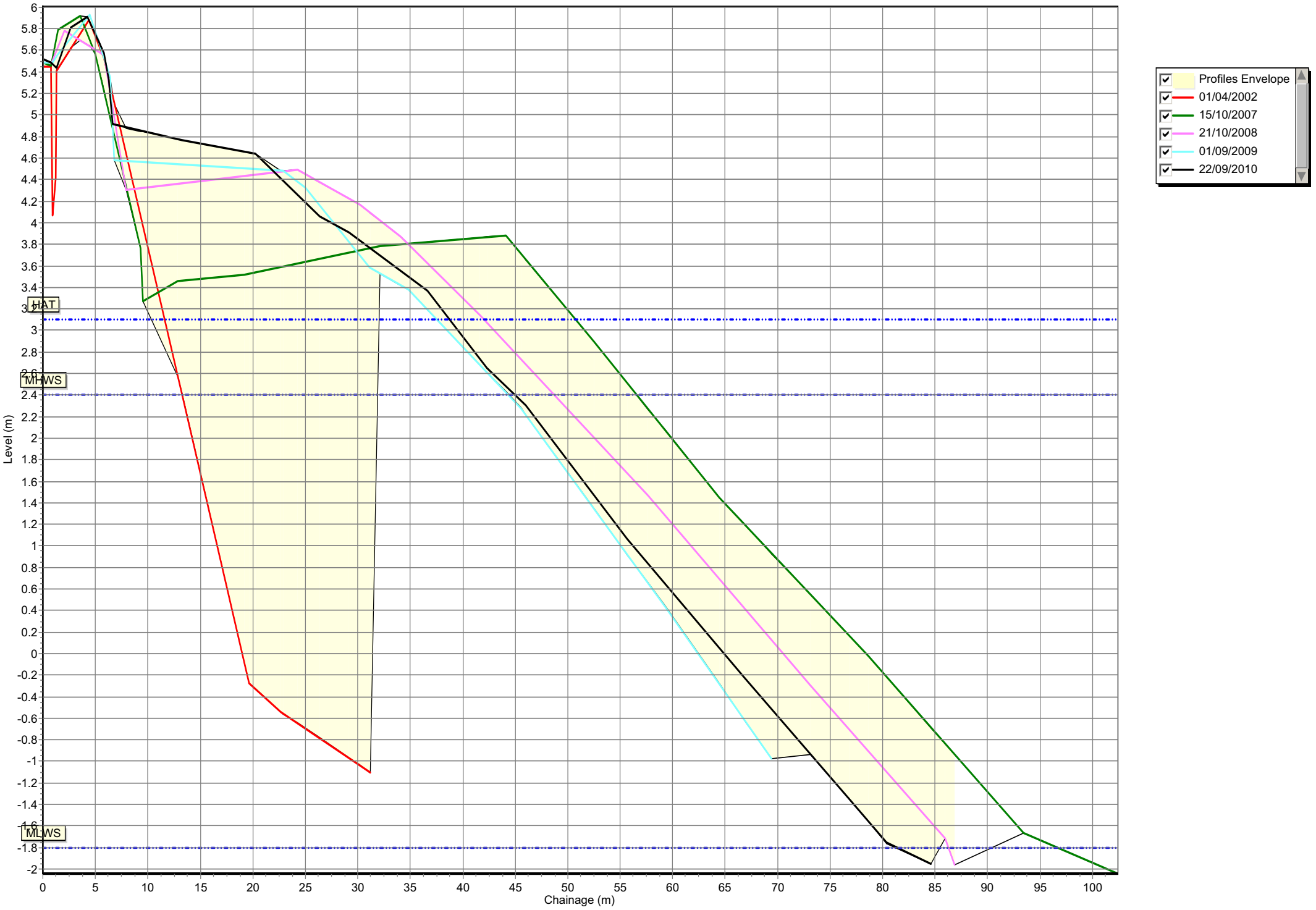


Beach Profiles: 1aWDC06



Beach Profiles: 1aWDC06A

Beach Profiles: 1aWDC07



Beach Profiles: 1aWDC08

Beach Profiles: 1aWDC09

Beach Profiles: 1aWDC10

Beach Profiles: 1aWDC11


Beach Profiles: 1aWDC12
Profiles Envelope
01/04/2002
15/10/2007
21/10/2008
01/09/2009
22/09/2010
HAT
MHWS
MLWS
Level (m)
Chainage (m)

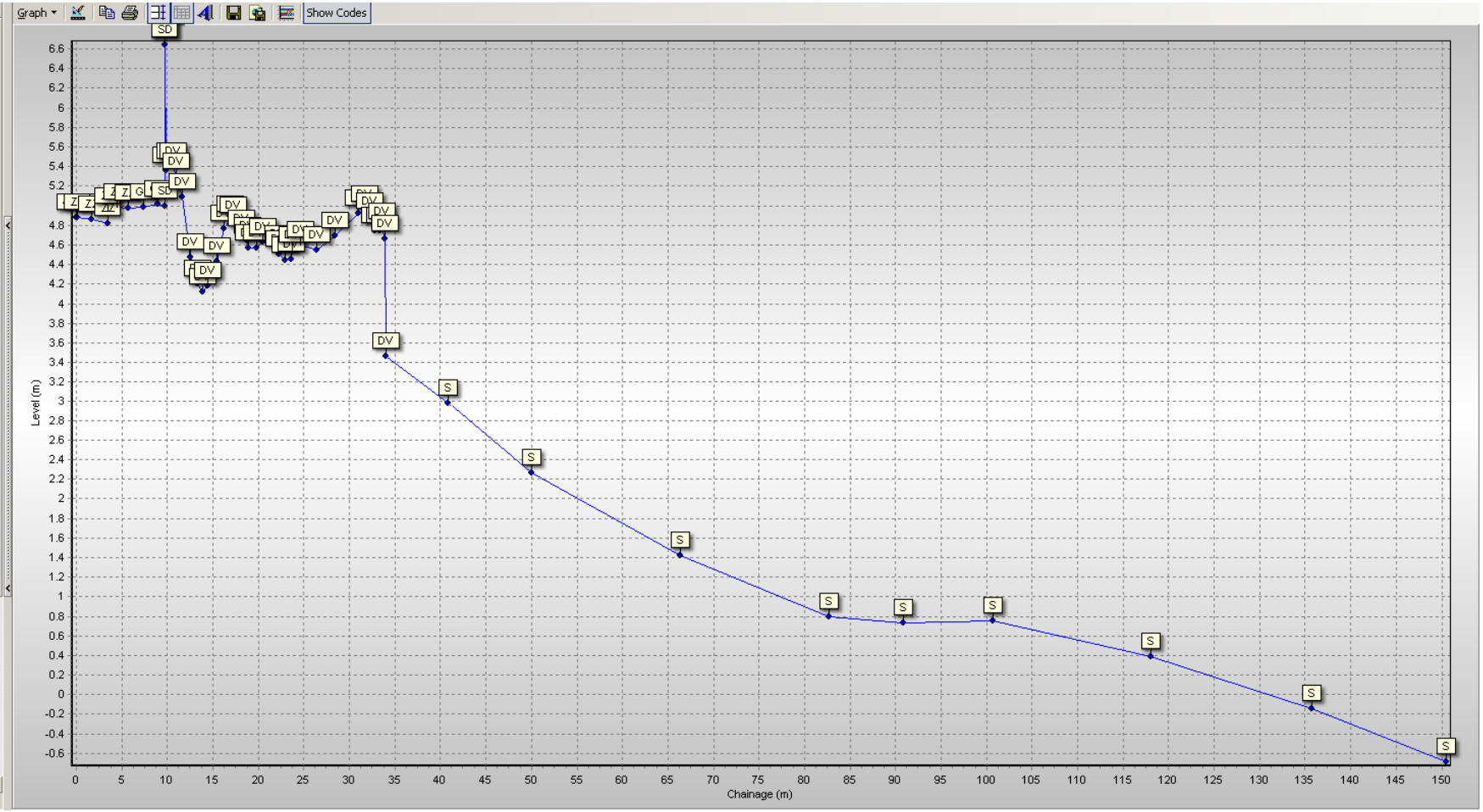
Beach Profiles: 1aWDC13

Beach Profiles: 1aWDC14

Northumberland CC (Blyth)

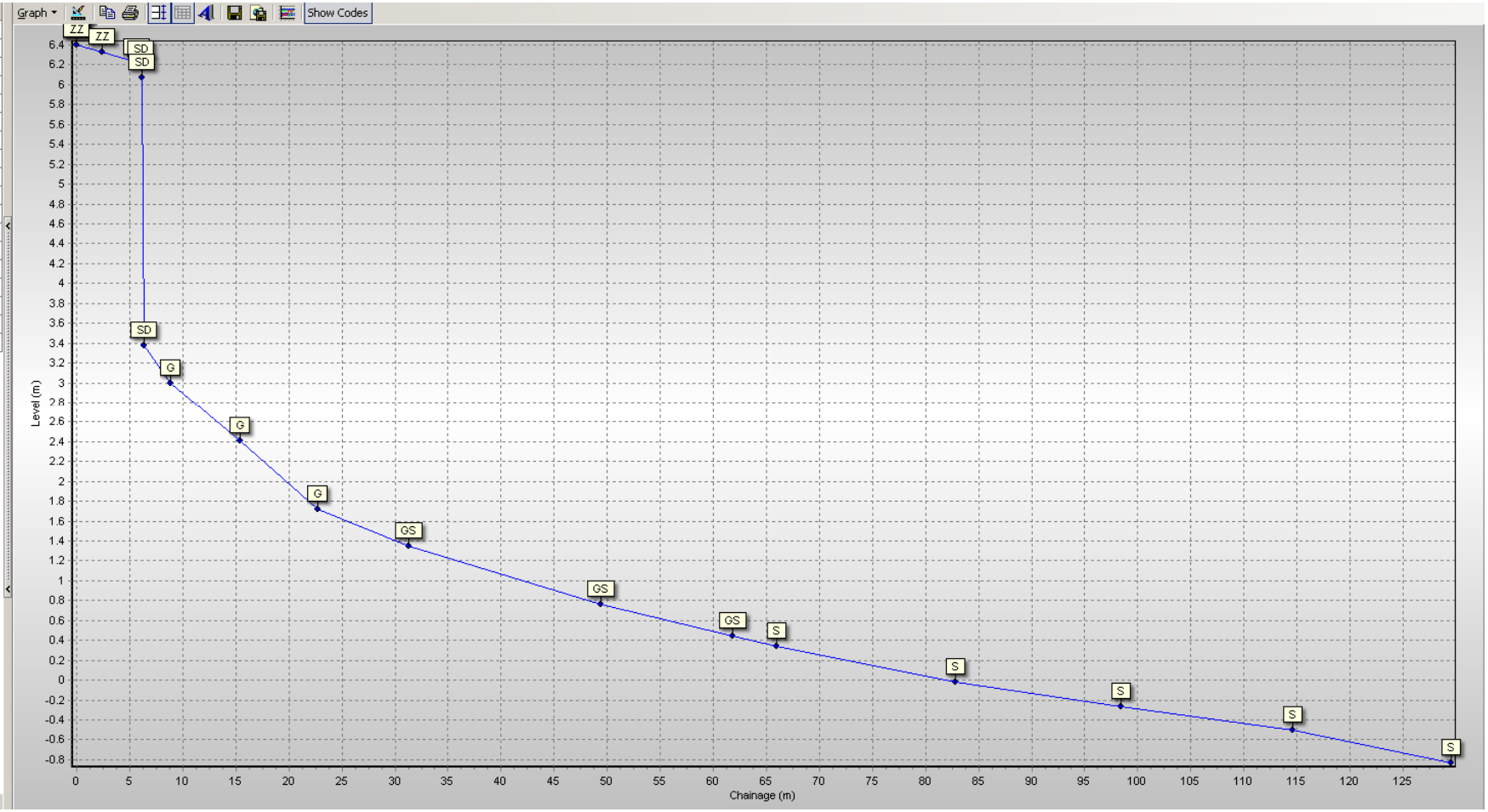
1aBVBC01 - 28/09/2010

Chainage	Level	Code
0.000	4.886	
0.086	4.886	ZZ
1.676	4.864	ZZ
3.454	4.819	ZZ
3.493	4.944	ZZ
4.461	4.985	ZZ
5.737	4.977	ZZ
7.333	4.981	GR
8.924	5.015	GR
9.685	4.994	SD
9.744	6.643	SD
9.790	6.643	SD
9.847	5.362	SD
10.264	5.400	DV
10.578	5.405	DV
10.998	5.302	DV
11.661	5.091	DV
12.574	4.474	DV
13.321	4.203	DV
13.867	4.118	DV
14.457	4.178	DV
15.417	4.433	DV
16.214	4.764	DV
16.842	4.863	DV
17.219	4.853	DV
18.092	4.712	DV
18.746	4.643	DV
18.958	4.564	DV
19.814	4.569	DV
20.422	4.628	DV
22.108	4.554	DV
22.268	4.506	DV
22.929	4.440	DV
23.613	4.454	DV
23.756	4.546	DV
24.632	4.600	DV
26.443	4.549	DV
28.459	4.689	DV
30.947	4.924	DV
31.669	4.966	DV
32.279	4.891	DV
32.783	4.750	DV



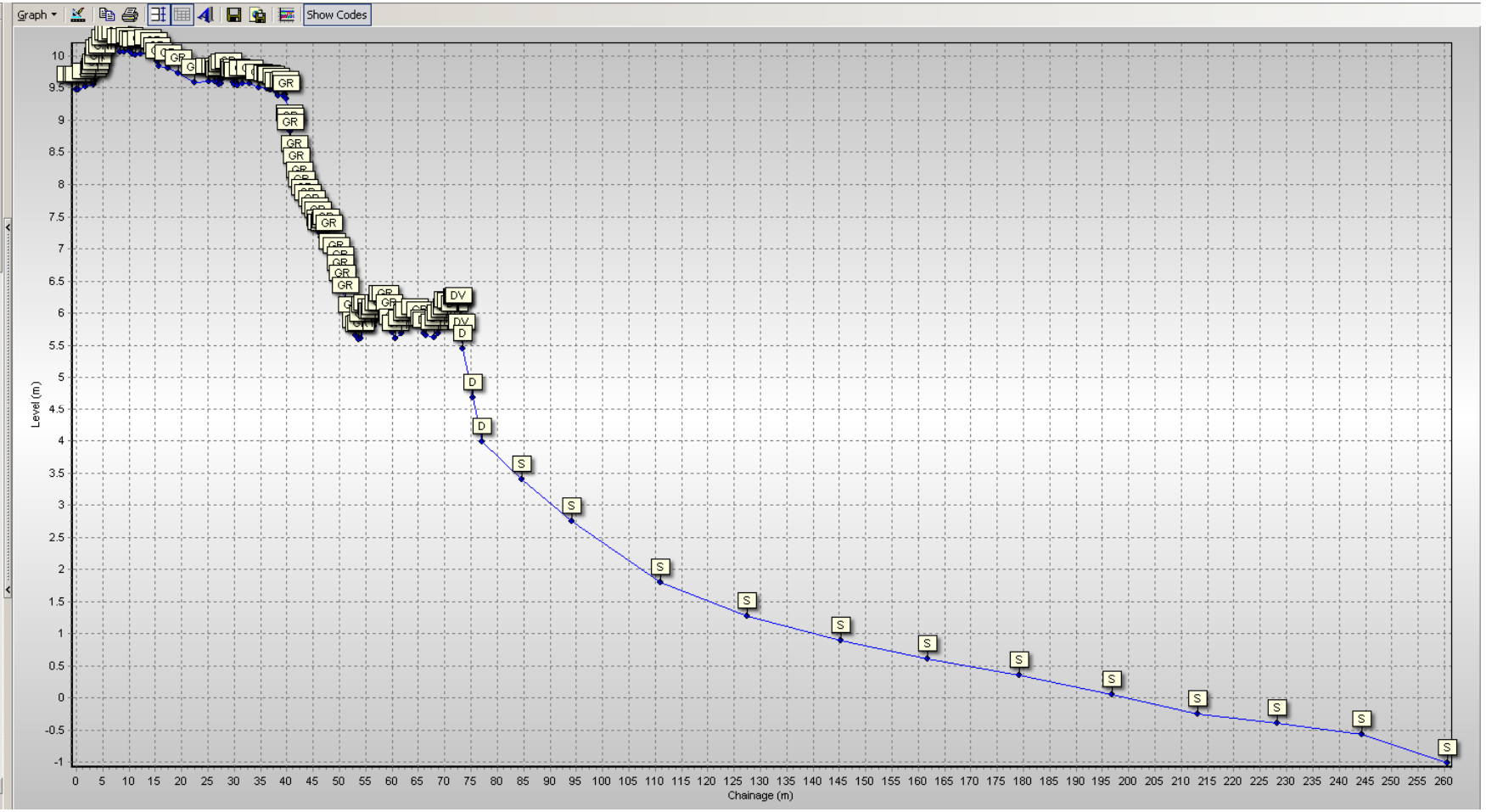
1aBVBC02 - 28/09/2010

Chainage	Level	Code
0.000	6.400	
0.025	6.400	ZZ
2.384	6.324	ZZ
5.667	6.220	ZZ
6.059	6.202	SD
6.125	6.075	SD
6.314	3.375	SD
8.829	2.999	G
15.403	2.405	G
22.699	1.723	G
31.310	1.347	GS
49.447	0.758	GS
61.807	0.448	GS
66.015	0.345	S
82.856	-0.017	S
98.462	-0.266	S
114.576	-0.504	S
129.529	-0.832	S



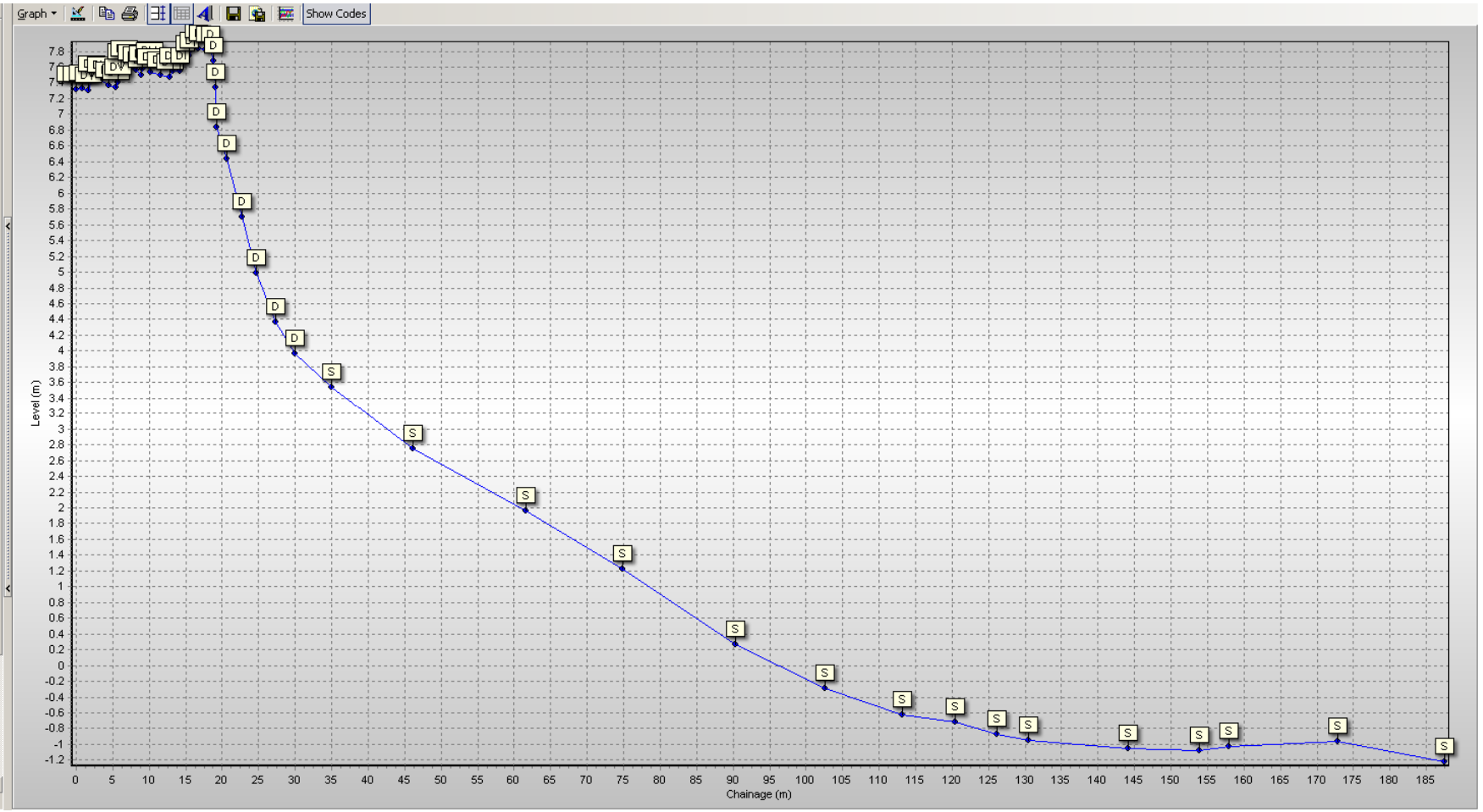
1aBVBC03 - 28/09/2010

Chainage	Level	Code
0.000	9.479	
0.016	9.479	GR
0.378	9.475	ZZ
1.746	9.531	ZZ
3.246	9.549	ZZ
3.543	9.603	GR
3.703	9.672	GR
4.012	9.758	GR
4.216	9.895	GR
4.769	9.925	GR
5.474	10.052	GR
5.934	10.119	GR
6.534	10.110	GR
7.322	10.142	GR
8.239	10.068	GR
9.120	10.064	GR
10.020	10.081	GR
10.563	10.032	GR
11.307	10.009	GR
12.238	10.032	GR
13.574	10.048	GR
14.772	10.003	GR
15.278	9.924	GR
15.713	9.848	GR
17.512	9.804	GR
19.399	9.730	GR
22.460	9.590	GR
25.213	9.610	GR
26.367	9.609	GR
26.852	9.597	GR
27.096	9.558	GR
27.440	9.575	GR
27.679	9.628	GR
28.046	9.670	GR
28.916	9.678	GR
29.741	9.582	GR
30.048	9.555	GR
30.386	9.590	GR
30.545	9.545	GR
31.548	9.574	GR
32.924	9.565	GR
34.635	9.515	GR



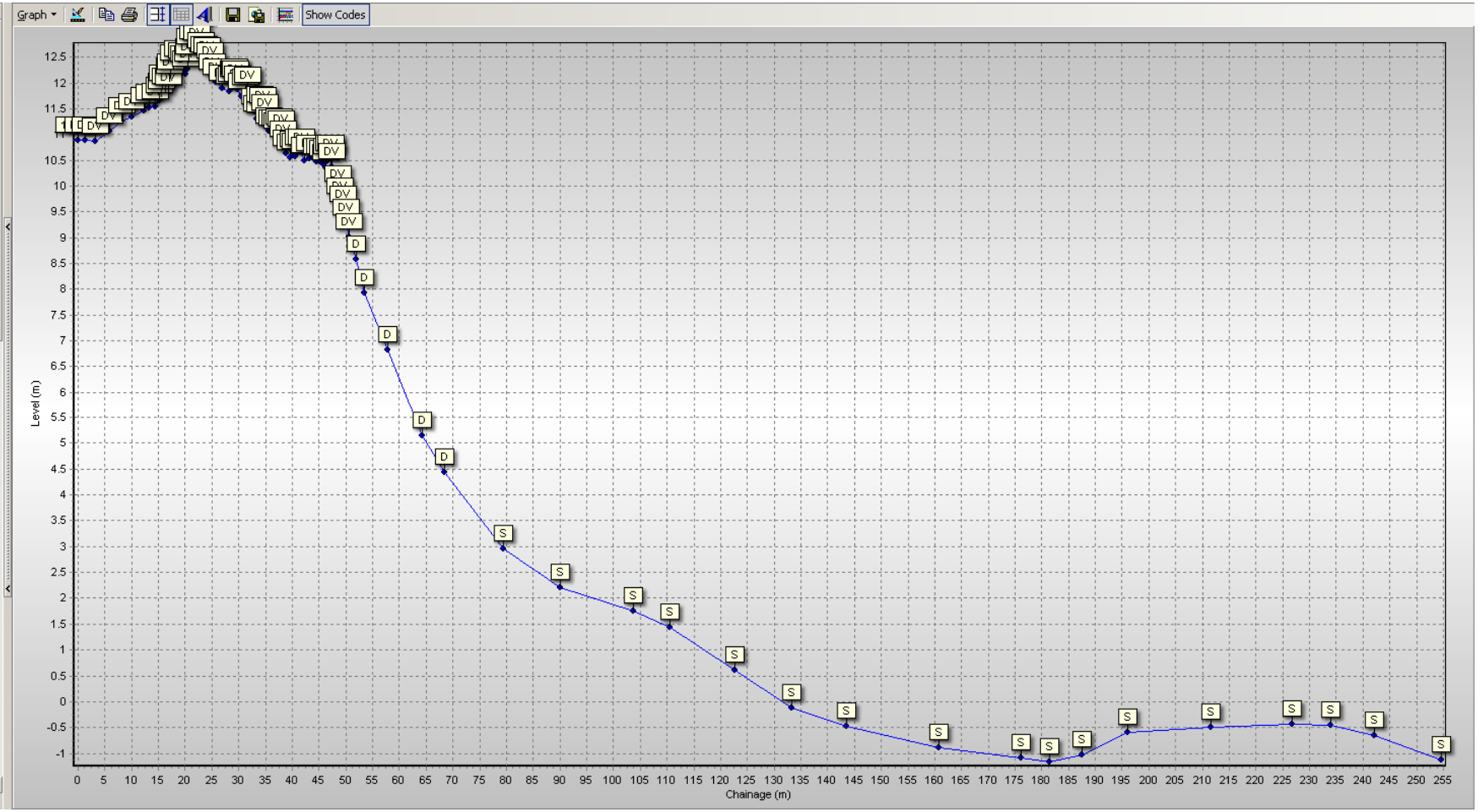
1aBVBC04 - 28/09/2010

Chainage	Level	Code
0.000	7.319	
0.020	7.319	DV
0.784	7.331	DV
1.609	7.309	DV
2.092	7.443	DV
3.286	7.428	DV
4.440	7.366	DV
5.402	7.336	DV
5.700	7.409	DV
6.158	7.606	DV
6.600	7.643	DV
7.482	7.584	DV
8.287	7.558	DV
8.854	7.498	DV
9.117	7.569	DV
9.991	7.608	DV
10.206	7.539	DV
11.525	7.499	DV
12.773	7.476	DV
13.198	7.554	DV
14.230	7.549	D
14.890	7.707	D
15.511	7.744	D
16.230	7.872	D
16.753	7.833	D
17.692	7.818	D
18.431	7.818	D
18.767	7.682	D
19.072	7.348	D
19.305	6.832	D
20.586	6.437	D
22.744	5.696	D
24.641	4.993	D
27.309	4.369	D
30.026	3.964	D
34.992	3.540	S
46.113	2.752	S
61.677	1.955	S
74.904	1.221	S
90.333	0.266	S
102.641	-0.295	S
113.147	-0.622	S



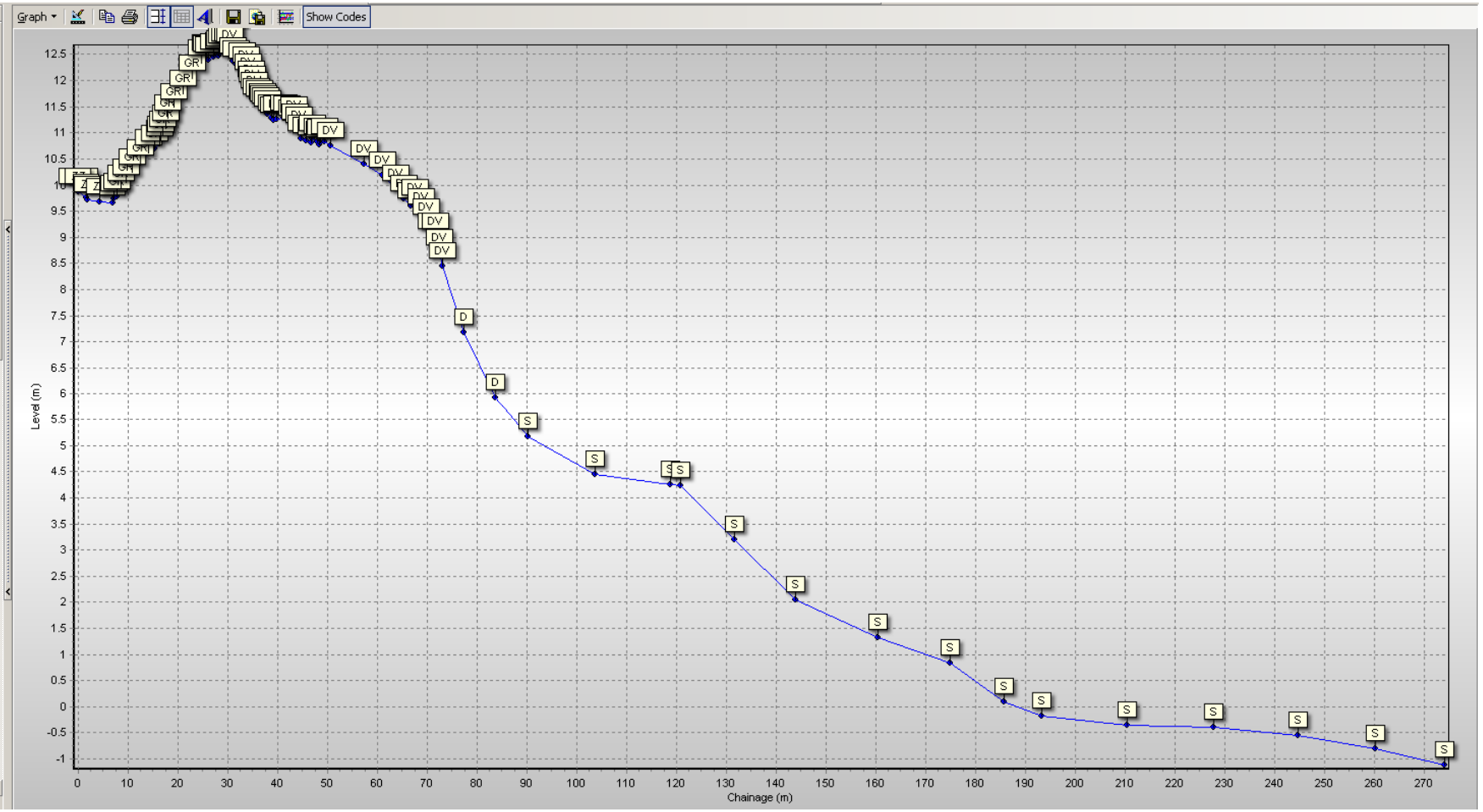
1aBVBC05 - 28/09/2010

Chainage	Level	Code
0.000	10.896	
0.014	10.896	DV
1.236	10.893	DV
3.292	10.871	DV
5.941	11.073	DV
8.201	11.273	DV
10.104	11.337	DV
12.282	11.470	DV
13.262	11.522	DV
14.366	11.539	DV
15.198	11.666	DV
15.467	11.741	DV
15.693	11.894	DV
16.353	11.831	DV
16.884	11.814	DV
17.065	12.039	DV
17.188	12.121	DV
17.909	12.285	DV
18.655	12.369	DV
19.271	12.325	DV
19.717	12.265	DV
20.140	12.164	DV
20.475	12.262	DV
20.639	12.415	DV
20.895	12.600	DV
21.420	12.704	DV
22.221	12.676	DV
22.998	12.517	DV
23.536	12.440	DV
24.107	12.421	DV
24.559	12.327	DV
25.095	12.113	DV
25.868	12.021	DV
26.858	11.890	DV
28.337	11.830	DV
28.695	11.873	DV
29.083	11.966	DV
29.173	12.019	DV
29.366	11.972	DV
29.861	11.879	DV
30.506	11.745	DV
31.302	11.808	DV

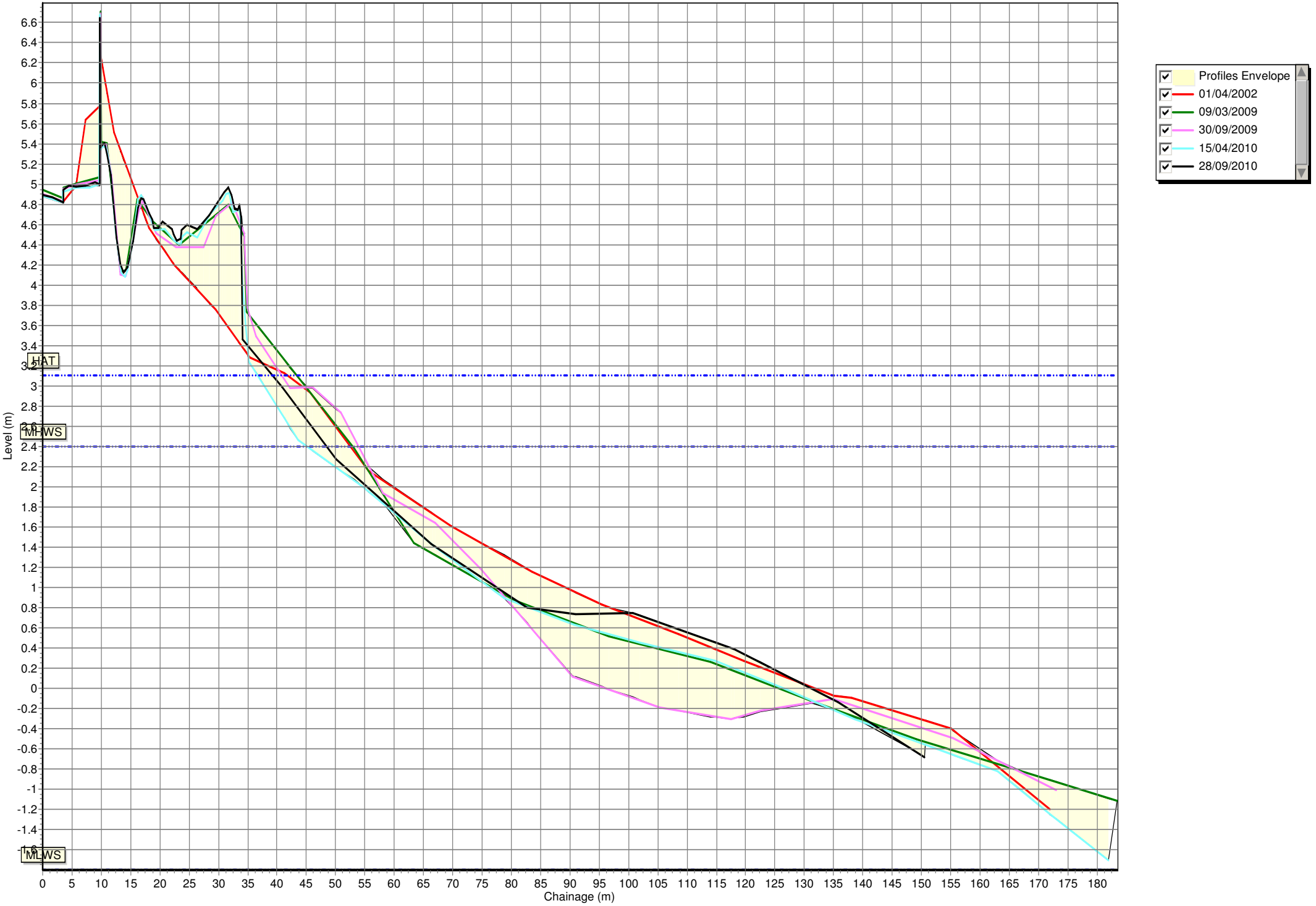


1aBVBC06 - 28/09/2010

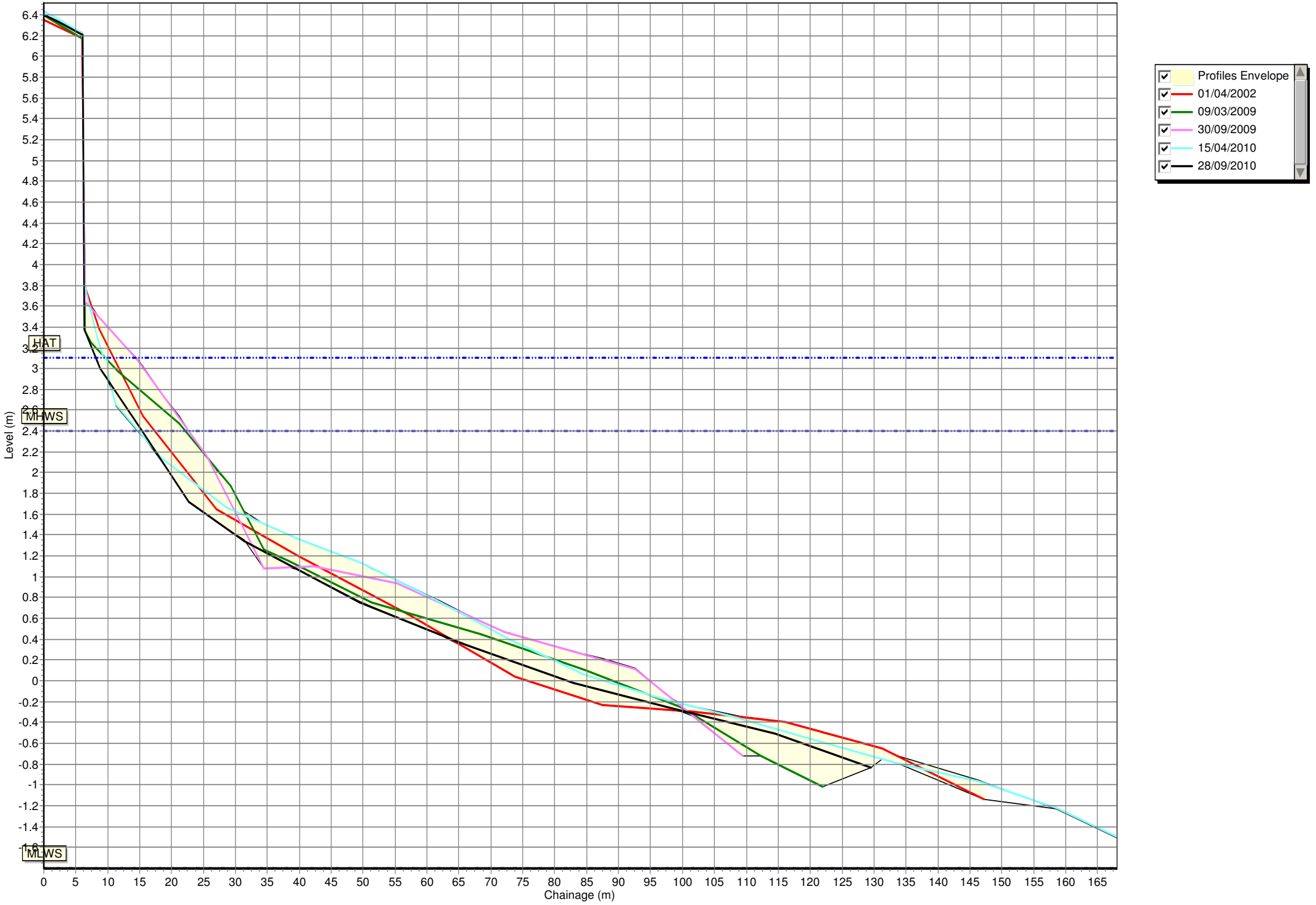
Chainage	Level	Code
0.000	9.872	
0.026	9.872	ZZ
1.669	9.754	ZZ
1.754	9.722	ZZ
4.340	9.676	ZZ
6.905	9.650	ZZ
7.088	9.740	GR
7.828	9.767	GR
8.509	9.929	GR
9.512	10.053	GR
10.891	10.247	GR
12.367	10.422	GR
14.097	10.612	GR
15.296	10.695	GR
16.330	10.800	GR
16.521	10.877	GR
16.921	10.961	GR
17.528	11.088	GR
18.029	11.280	GR
19.182	11.501	GR
21.103	11.748	GR
22.881	12.042	GR
24.727	12.325	GR
25.413	12.428	GR
25.772	12.408	GR
26.191	12.401	ZZ
27.174	12.446	ZZ
28.186	12.475	ZZ
28.319	12.514	GR
28.755	12.559	GR
29.330	12.597	GR
29.994	12.606	DV
30.366	12.584	DV
30.939	12.375	DV
31.554	12.313	DV
32.787	12.266	DV
33.685	12.196	DV
33.980	12.069	DV
34.579	11.922	DV
34.927	11.820	DV
35.311	11.711	DV
35.777	11.594	DV



Beach Profiles: 1aBVBC01

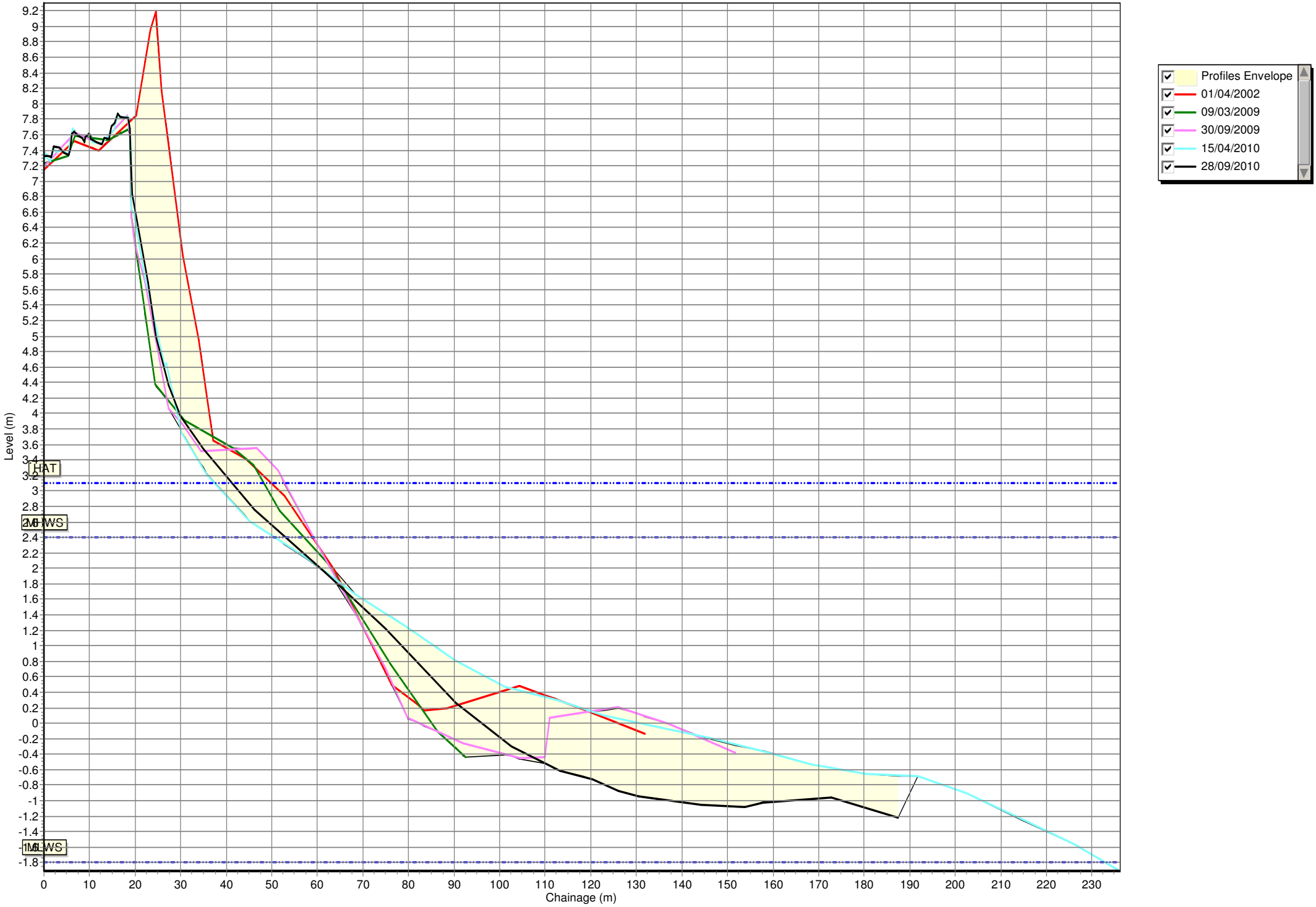


Beach Profiles: 1aBVBC02



Beach Profiles: 1aBVBC03

Beach Profiles: 1aBVBC04

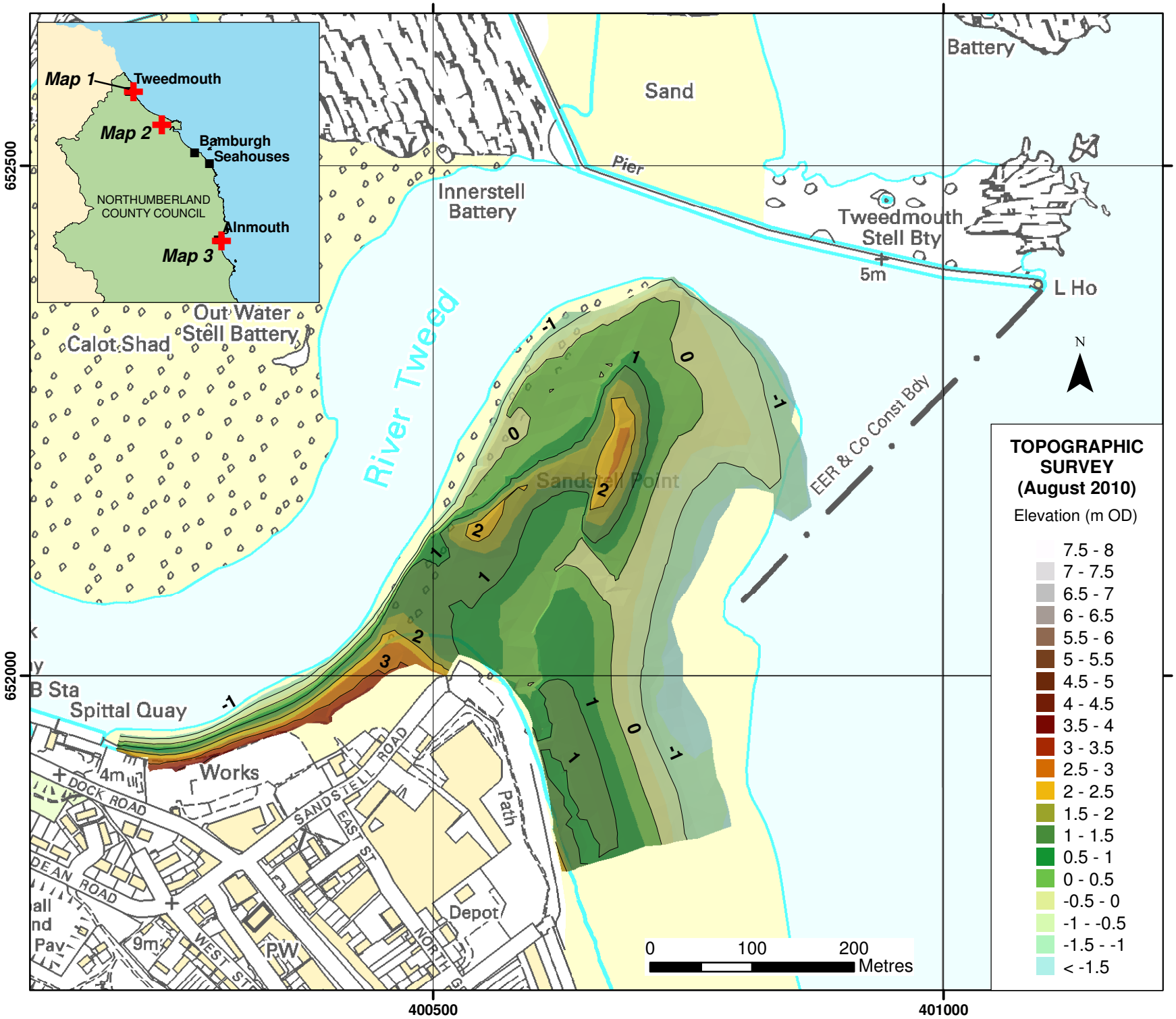


Beach Profiles: 1aBVBC05

Beach Profiles: 1aBVBC06

Appendix B

Topographic Surveys



TOPOGRAPHIC SURVEY (August 2010)

Elevation (m OD)

- 7.5 - 8
- 7 - 7.5
- 6.5 - 7
- 6 - 6.5
- 5.5 - 6
- 5 - 5.5
- 4.5 - 5
- 4 - 4.5
- 3.5 - 4
- 3 - 3.5
- 2.5 - 3
- 2 - 2.5
- 1.5 - 2
- 1 - 1.5
- 0.5 - 1
- 0 - 0.5
- -0.5 - 0
- -1 - -0.5
- -1.5 - -1
- < -1.5

Topographic Contours at 1 metre interval

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Appendix B - Map 1a Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:5,000 at A4

Drawn by:	TC	Date: 22/10/2010
Checked by:	NC	Date: 29/10/2010
Approved by:	NC	Date: 29/10/2010

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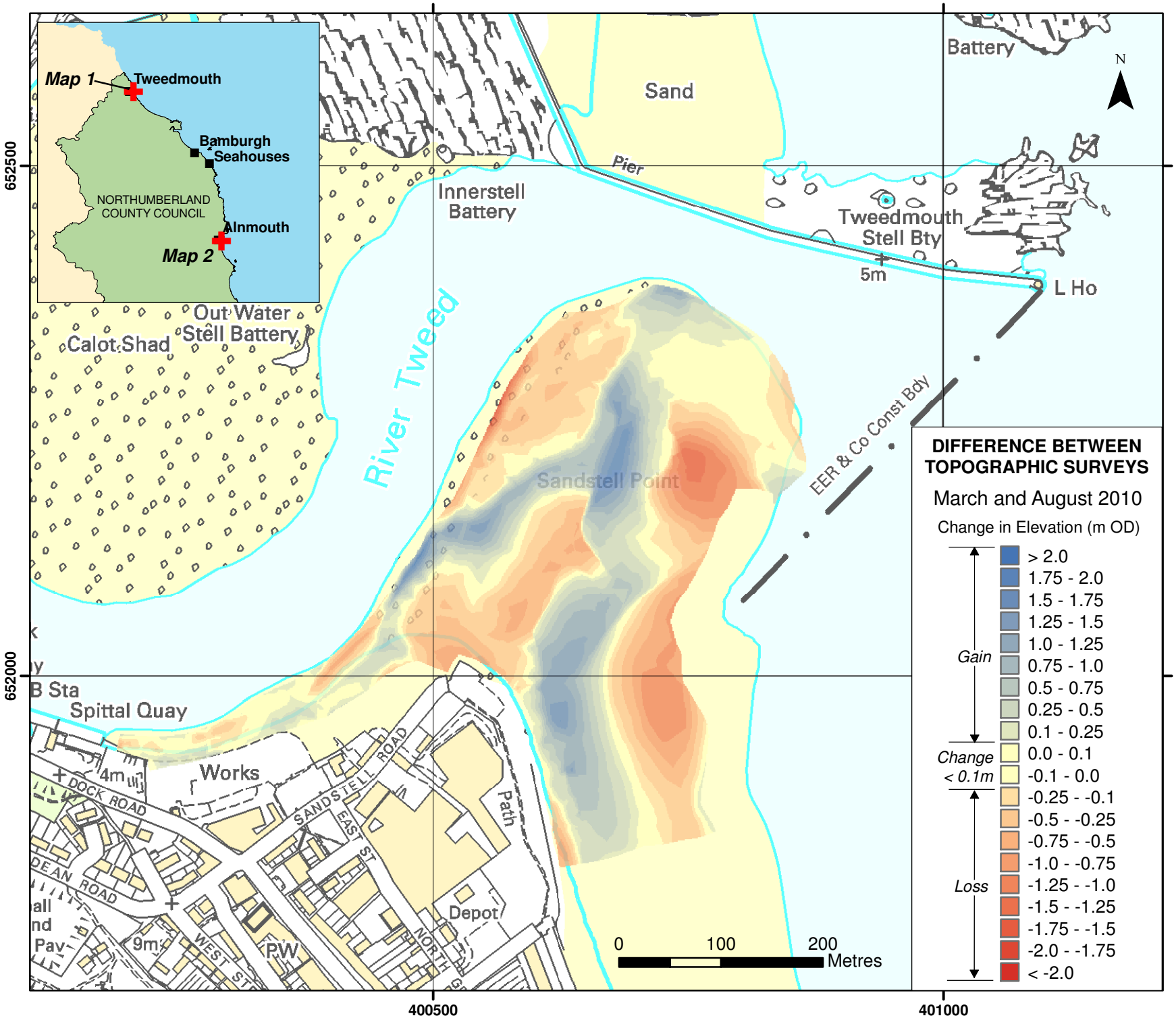

DIFFERENCE BETWEEN TOPOGRAPHIC SURVEYS

March and August 2010

Change in Elevation (m OD)

Gain	> 2.0
	1.75 - 2.0
	1.5 - 1.75
	1.25 - 1.5
	1.0 - 1.25
	0.75 - 1.0
	0.5 - 0.75
	0.25 - 0.5
	0.1 - 0.25
Change < 0.1m	0.0 - 0.1
	-0.1 - 0.0
Loss	-0.25 - -0.1
	-0.5 - -0.25
	-0.75 - -0.5
	-1.0 - -0.75
	-1.25 - -1.0
	-1.5 - -1.25
	-1.75 - -1.5
	-2.0 - -1.75
	< -2.0

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Appendix B - Map 1b Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:5,000 at A4

Drawn by:	TC	Date:	22/10/2010
Checked by:	NC	Date:	29/10/2010
Approved by:	NC	Date:	29/10/2010

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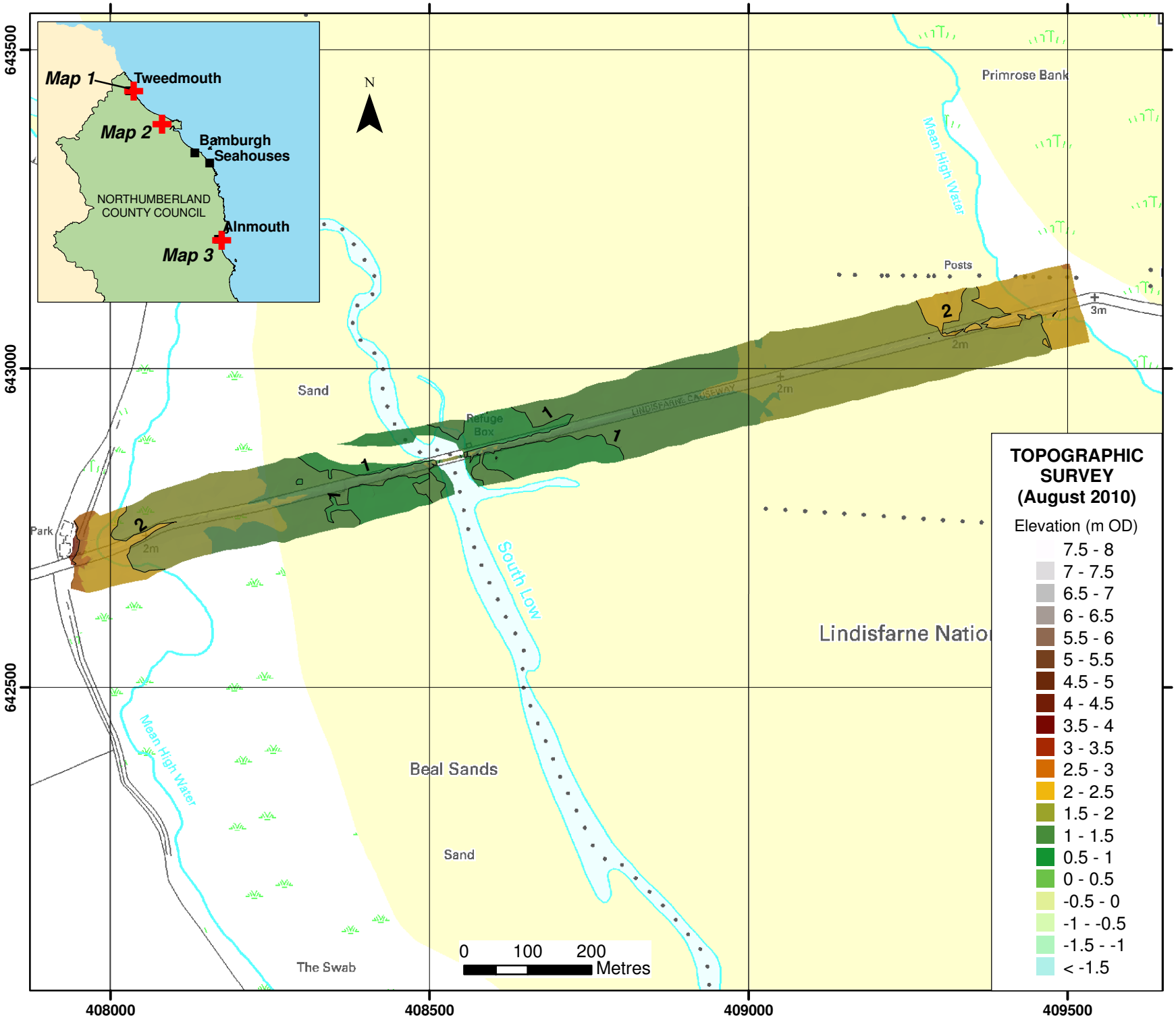

TOPOGRAPHIC SURVEY (August 2010)

Elevation (m OD)

- 7.5 - 8
- 7 - 7.5
- 6.5 - 7
- 6 - 6.5
- 5.5 - 6
- 5 - 5.5
- 4.5 - 5
- 4 - 4.5
- 3.5 - 4
- 3 - 3.5
- 2.5 - 3
- 2 - 2.5
- 1.5 - 2
- 1 - 1.5
- 0.5 - 1
- 0 - 0.5
- -0.5 - 0
- -1 - -0.5
- -1.5 - -1
- < -1.5

Topographic Contours at 1 metre interval

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Appendix B - Map 2a Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:8,000 at A4

Drawn by:	TC	Date:	22/10/2010
Checked by:	NC	Date:	29/10/2010
Approved by:	NC	Date:	29/10/2010

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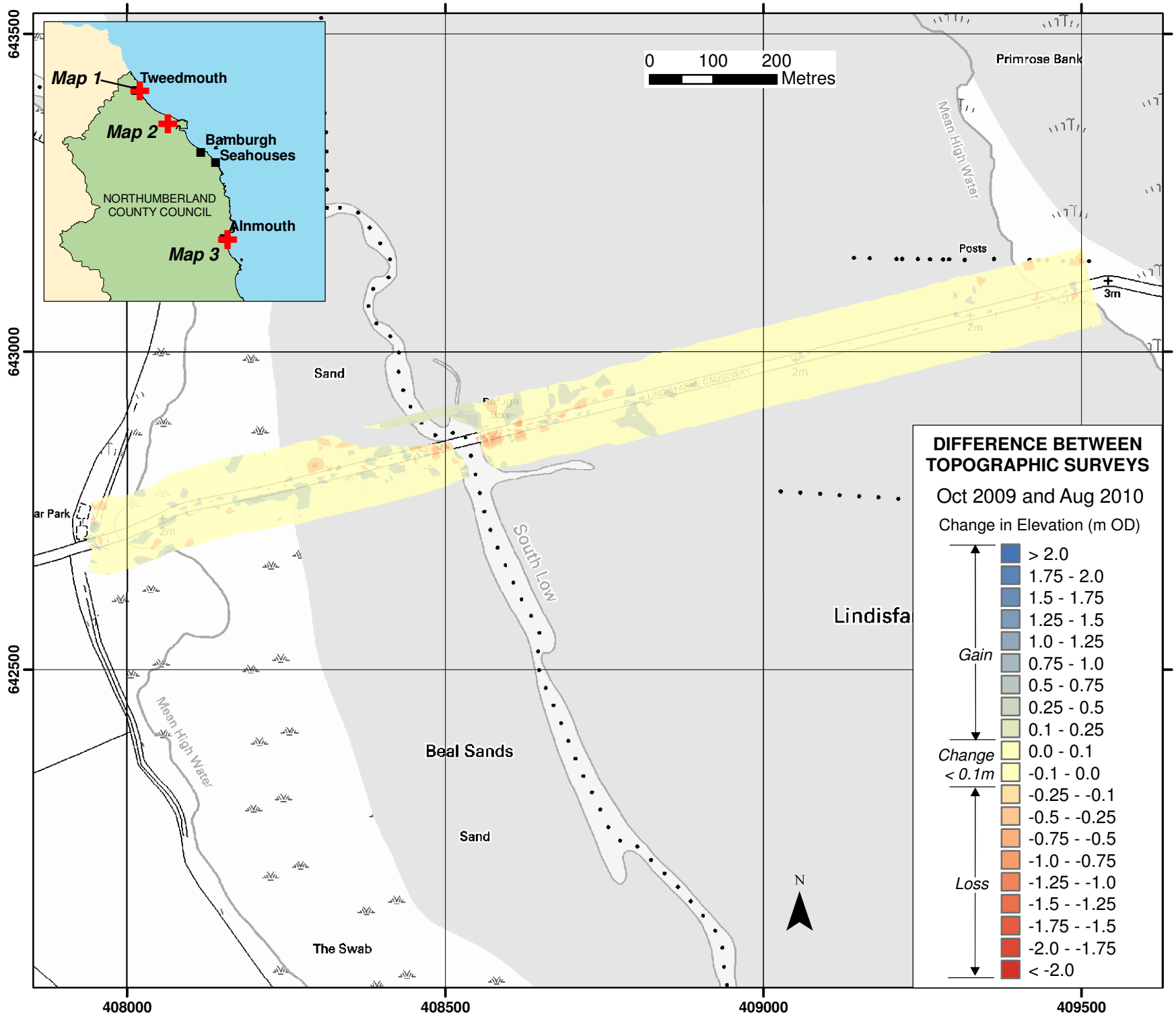

DIFFERENCE BETWEEN TOPOGRAPHIC SURVEYS

Oct 2009 and Aug 2010

Change in Elevation (m OD)

Gain	> 2.0
	1.75 - 2.0
	1.5 - 1.75
	1.25 - 1.5
	1.0 - 1.25
	0.75 - 1.0
	0.5 - 0.75
	0.25 - 0.5
	0.1 - 0.25
Change < 0.1m	0.0 - 0.1
	-0.1 - 0.0
Loss	-0.25 - -0.1
	-0.5 - -0.25
	-0.75 - -0.5
	-1.0 - -0.75
	-1.25 - -1.0
	-1.5 - -1.25
	-1.75 - -1.5
	-2.0 - -1.75
	< -2.0

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Appendix B - Map 2b Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:8,000 at A4

Drawn by:	TC	Date: 22/10/2010
Checked by:	NC	Date: 29/10/2010
Approved by:	NC	Date: 29/10/2010

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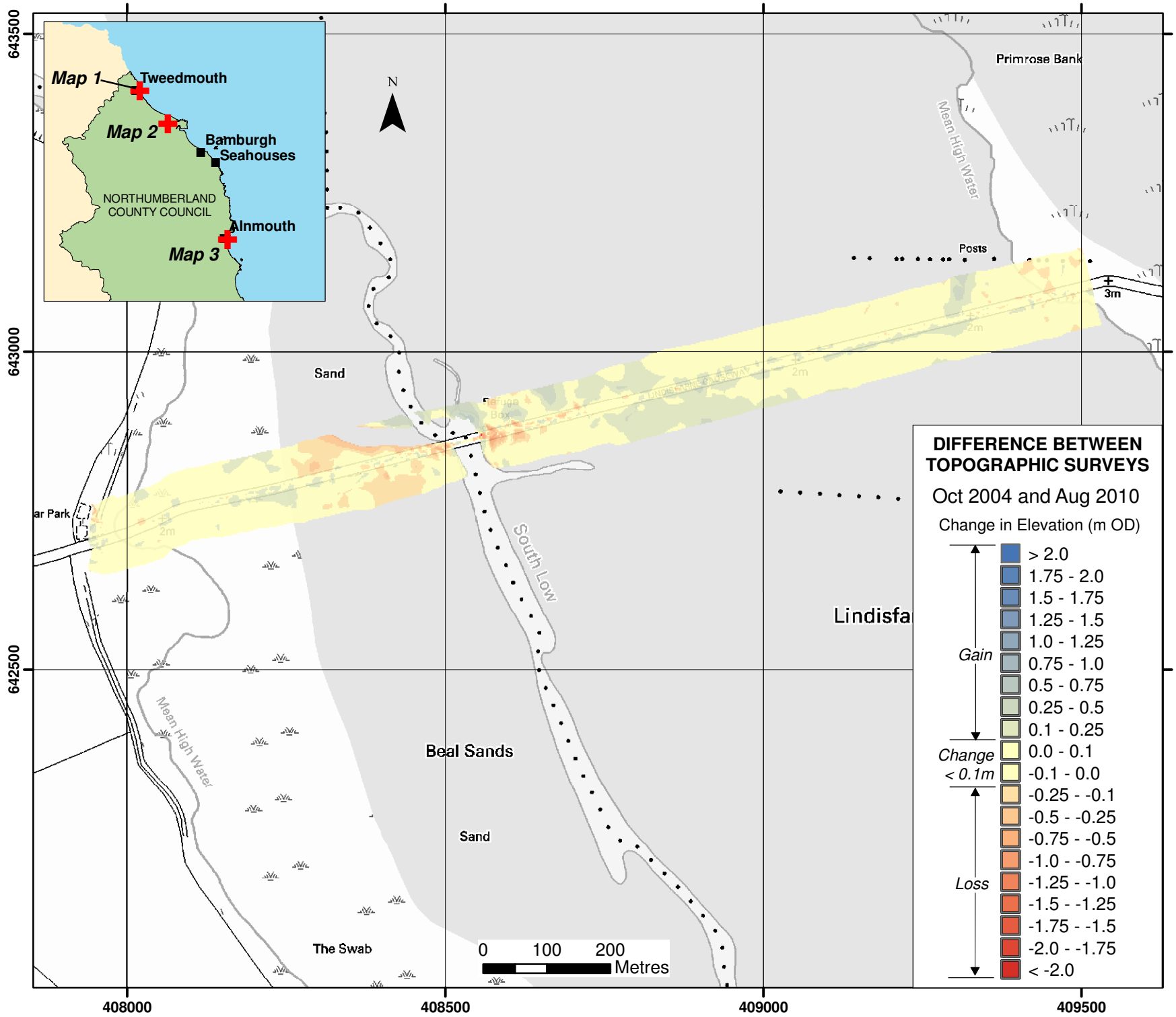

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Appendix B - Map 2c Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:8,000 at A4

Drawn by:	TC	Date: 22/10/2010
Checked by:	NC	Date: 29/10/2010
Approved by:	NC	Date: 29/10/2010

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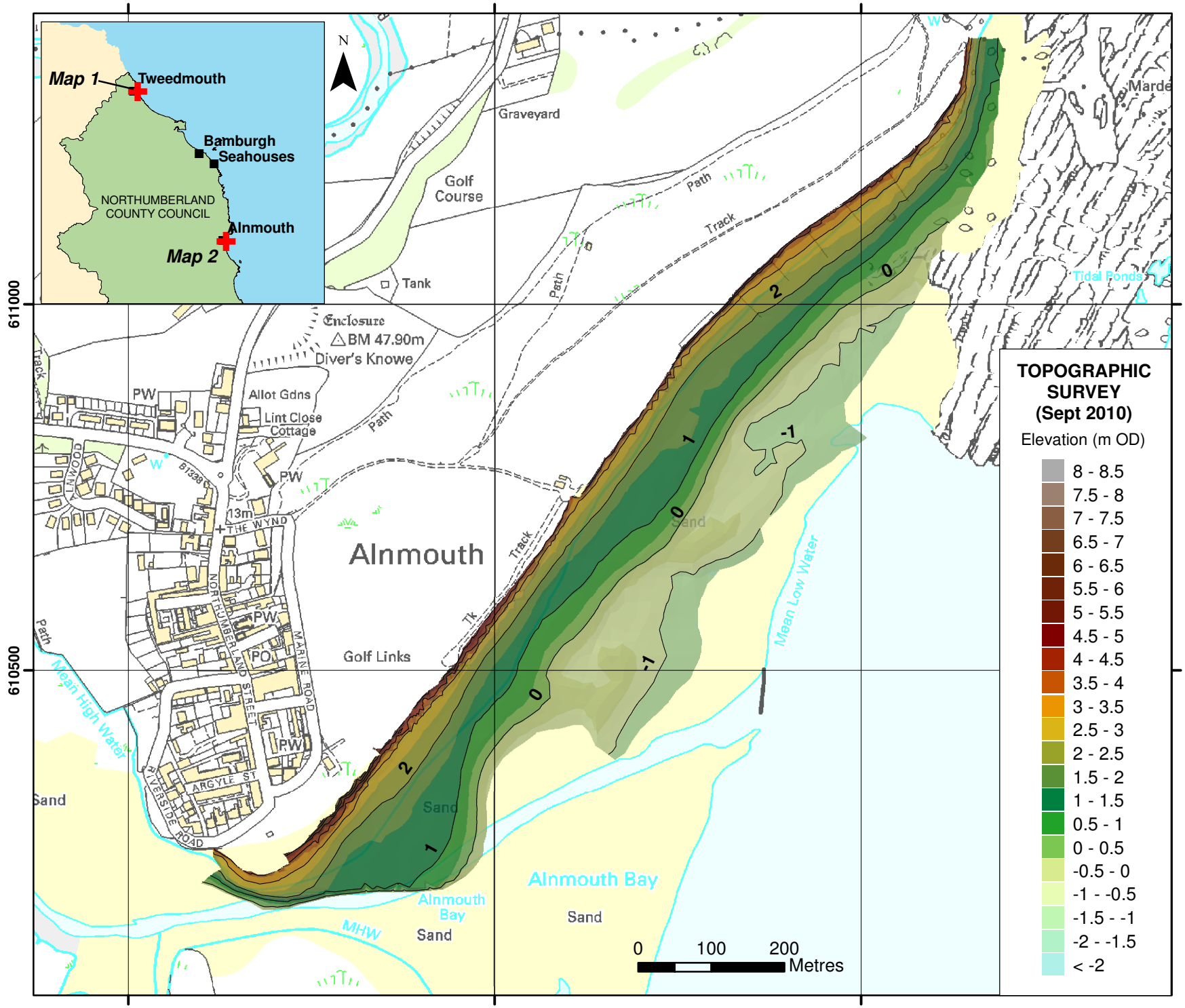
I:\9T6403\Technical_Data\gis\figure\7_FULL_measures_report_20101_Northumberland\Appendix_B_Map2c_Holy_Island.mxd



Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Appendix B - Map 3a Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:7,000 at A4

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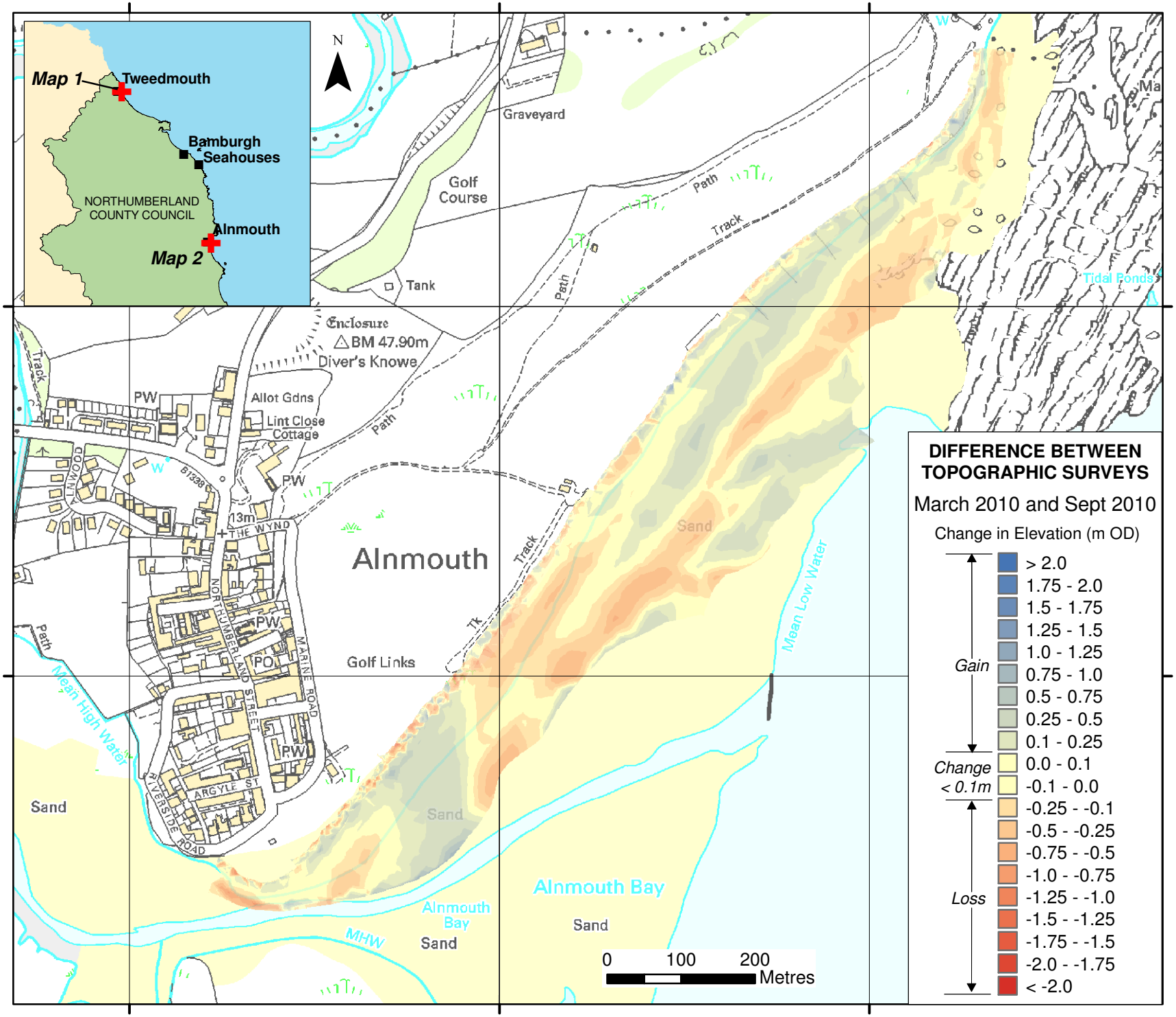

DIFFERENCE BETWEEN TOPOGRAPHIC SURVEYS

March 2010 and Sept 2010

Change in Elevation (m OD)

Gain	> 2.0
	1.75 - 2.0
	1.5 - 1.75
	1.25 - 1.5
	1.0 - 1.25
	0.75 - 1.0
	0.5 - 0.75
	0.25 - 0.5
	0.1 - 0.25
Change < 0.1m	0.0 - 0.1
	-0.1 - 0.0
Loss	-0.25 - -0.1
	-0.5 - -0.25
	-0.75 - -0.5
	-1.0 - -0.75
	-1.25 - -1.0
	-1.5 - -1.25
	-1.75 - -1.5
	-2.0 - -1.75
	< -2.0

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Appendix B - Map 3b Northumberland County Council Frontage

Analytical Report 3
'Full Measures' Survey 2010

Drawing Scale 1:7,000 at A4

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Appendix C

Cliff Top Surveys

Data relating to the cliff top surveys are best viewed as digital ‘kmz’ files loaded into Google Earth.