Practical examples of the legal position of the boundaries of estuaries and tidal rivers

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Abstract

The high water mark affects not only seaward boundaries of properties, but also properties fronting onto tidal rivers and estuaries. Environmental control zones are imposed over properties falling within a stated distance above the high water mark or in an estuary. This means that the high water mark and the limits of an estuary are key determinants not only of ownership but also of use, with particular emphasis on the right to develop. The Integrated Coastal Management Act, No. 24 of 2008 largely replaces the Sea Shore Act, No. 21 of 1935. In particular, it redefines the legal position of the high water mark.

The Land Survey Act, No. 8 of 1997 confirms that a Professional Land Surveyor is responsible for the determination of the position of all boundaries defining land parcels and land rights. Because of the contentious nature of the position of the bank of a tidal river or edge of a lake or vlei, Act No. 8 of 1997 requires that the Professional Land Surveyor determine the position in consultation with the Surveyor-General. How the Professional Land Surveyor identifies the position of the high water mark remains a dilemma for many because all these boundaries are ambulatory. Their position can and does change with time and therefore any positional determination of the bank of a tidal river or edge of a lake or vlei is at a specific point in time only.

The author has undertaken some research to define the position of the high water mark of sea-facing boundaries.

However, tidal rivers and estuaries are also affected by the sea, even if only periodically or occasionally. It has therefore become imperative that similar attention be given to the position of boundaries of tidal rivers and estuaries because there is some extra evidence that needs to be considered in terms of the definitions of “estuary”, “coastal wetland” and “water course”.

Keywords

high water mark, cadastral boundaries, tidal river, estuary, river bank, physical evidence, environmental legislation

Introduction

The high water mark, the middle of a river or the banks of a river or estuary can all be used to define the position of a property boundary or real right. However, these are not static boundaries – they are what are termed “ambulatory” boundaries – they can move with time as a result of normal erosion and accretion. Any determination of an ambulatory boundary is of its position at that point in time and is only an approximation of the position of the boundary at any date thereafter. Further, changes are made to legislation that affects the determination of positions of boundaries. It has therefore become imperative that the boundaries of tidal rivers and estuaries delineated on cadastral documents are defined by a re-determination of the physical position on the ground in terms of current legislation.

In the writer’s previous article (Williams-Wynn, 2012, p. 28), it is noted that:

“The key matters that are gleaned from the legislation are that:

- Legislation recognises that the high water mark is a legal boundary, which is ambulatory – it is continually changing its position as time goes by; and
- A Professional Land Surveyor, acting on behalf of the land owner and the Surveyor-General acting on behalf of the State and the citizens of the Republic jointly determine the position of a high water mark.

“The question is: “How is the position of the boundary determined for a point in time?” Act No. 24 of 2008 is silent on how the position of the high water mark is to be identified unless it is substituted with a boundary of another kind and,
therefore, any identification of position must be done exclusively in accordance with Act No. 8 of 1997. Although the author has had extensive experience in the identification process, that experience is limited to the Eastern Cape and KwaZulu-Natal coastlines.”

Yes, the legal position of boundaries of tidal rivers and estuaries are also affected by the high water mark. However, there are specific additional requirements that are to be considered, because tidal rivers and estuaries are affected not only by the ebb and flow of sea water as the tide comes in and goes out, but is also affected by the flow of water from the catchment area of the watercourse. This paper is therefore the writer’s interpretation of the current legislation defining the legal position of boundaries of estuaries and tidal rivers, using examples from cases with which he has had involvement in recent times along the Eastern Cape coast.

**Lawful and legitimate boundaries of estuaries and tidal rivers**

From the definitions of Act No. 24 of 2008, it is noted that:

“’Estuary' means a body of surface water-

(a) that is part of a water course that is permanently or periodically open to the sea;

(b) in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the water course is open to the sea; or

(c) in respect of which the salinity is measurably higher as a result of the influence of the sea.”

**Coastal wetland’ means-**

(a) any wetland in the coastal zone; and

(b) includes-

i. land adjacent to coastal waters that is regularly or periodically inundated by water, salt marshes, mangrove areas, inter-tidal sand and mud flats, marshes, and minor coastal streams regardless of whether they are of a saline, freshwater or brackish nature; and

ii. the water, the subsoil and substrata beneath, and bed and banks of, any such wetland;”

Reading these definitions together with Section 7 of Act No. 24 of 2008, any estuary or tidal river, unless lawfully alienated, is part of the coastal public property. Water course is defined in Section 1(xxiv) of Act No. 36 of 1998 as:
“Water course’ means-

(a) a river or spring;
(b) a natural channel in which water flows regularly or intermittently;
(c) a wetland, lake or dam into which, or from which, water flows; and
(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a water course includes, where relevant, its beds and banks.”

Fig. 2: Flood plain of the Ingwenyama estuary, with indicative wetland halophytic vegetation and storm debris. Photograph: Chris Williams-Wynn.

Government Notice, No. R. 546 of 2010, has a very similar definition, only adding the words “or depression” after “a natural channel”. Therefore, a watercourse includes the river, the estuary and any associated coastal wetland that is “regularly or periodically inundated by water”. The Surveyors-General agreed by resolution taken at their “Technical Matters Meeting of the Surveyors-General”, held on the 4 – 5 December 2012 that:

“In determining the outer boundary of an estuary, the following matters should be taken into consideration:

- The body of surface water that is part of a water course that is permanently or periodically open to the sea, in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the water course is open to the sea; or in respect of which the salinity is measurably higher as a result of the influence of the sea;
- Any wetland adjacent to coastal waters that is regularly or periodically inundated by water, salt marshes, mangrove areas, inter-tidal sand and mud flats, marshes, and minor coastal streams regardless of whether they are of a saline, freshwater or brackish nature; and
- The bed and banks of, any such wetland.”

Both definitions of “wetland” and “water course” above refer to the banks. The right or left bank of a river is defined in the Land Survey Regulations as:

“Right or left bank of a river’ means that bank of the river which is on his or her right or left side, as the case might be, when the observer is looking downstream.”

However, what constitutes the river bank is not defined in legislation, but instead has become common law as a result of court judgements. The judge in the River View Case (1921 GWLD 207) as quoted in De Smidt, 1992, states that, based on the De Bad case (1917 AD 360), the bank should be defined as: “… a line just above the high water mark, that is on the Vaal River the highest line reached by the ordinary summer floods ...” Please note here that the judge’s high water mark is not the high water mark of the sea, but that of the lines of extremity of the rise of the river between the two
banks and hence the lines to be adopted as the left and right banks of the river. This judgement has defined common law practice and land survey practice ever since. However, in order to ensure that this practice was upheld, the Surveyors-General took the following resolution at the “Technical Matters Meeting of the Surveyors-General”, held on the 4 – 5 December 2012:

“The inner and outer (or left and right) banks of a river are the highest lines reached by the water of the river during regular annual storms, but excluding any abnormal or exceptional floods.”

This therefore confirms that the boundary of any water course and hence specifically an estuary or tidal river extends to the extremity of the river banks as defined above, which is above (outside) the “wetland adjacent to coastal waters that are regularly or periodically inundated by water”. It is noted that it is often the river channel that changes position dramatically, even as a result of normal storm activity, but the whole water course between the two banks as defined above generally changes imperceptibly over time as a result of natural erosion and accretion.

**The upstream limit of the tidal river or estuary**

As a result of the above argument and in order to be absolutely clear regarding what defines the limits of a tidal river or estuary are, the following concise summary is given:

“**Estuary**' means a body of surface water, coastal wetland or tidal river –

(a) that is permanently or periodically open to the sea and in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the body of surface water, coastal wetland or tidal river is open to the sea; and

(b) in respect of which the salinity is higher than fresh water as a result of the influence of the sea, and where there is a salinity gradient between the tidal reach and the mouth of the body of surface water, coastal wetland or tidal river; and shall extend to the banks of the body of surface water, coastal wetland or tidal river, being the highest lines reached by the water during regular annual storms, but excluding any abnormal or exceptional floods.”

From this, it can be seen that the key upstream extremity of the tidal river or estuary is the place where the sea no longer has any influence on the water course. This is the place at which the water flow is exclusively from source to sea, and where the sea water no longer mixes with the fresh water. The so-called “ebb and flow” often defines this point, and is generally well-known to older locals who have resided in the area for many years. Andy Russell, one of the owners adjoining the Ingwenyama River noted during a site inspection with the writer on 29 May 2013 that the first fording
place along the rivers was often above (or at) the ebb and flow, where the oxen, horses and livestock could drink fresh water as they crossed the rivers.

Guidelines for other sources of evidence that can give an approximate idea of the position of the boundary

There is only one line delineating the position of the high water mark, and this is the lawful position – the cadastral boundary – defined by physical evidence surveyed on the ground at a specific point in time. Peter et al, 2013, determined the following guidelines for the types of additional evidence – especially for a quick desk-top study – that can be used in defining the position of the high water mark, including the high water mark of tidal rivers and estuaries, which would all contribute to the final determination by a professional land surveyor with the concurrence of the Surveyor-General.

Fig. 4: Rough sketch of the 5 m contour line surrounding the Ingwenyama estuary. Source: Buffalo City Metro Municipality GIS website.

- Many municipalities, notably the Ethekwini, Nelson Mandela and Overberg Municipalities have made their own determination of a conservative high water mark. These may have been done by their in-house professional land surveyors, but would need to have been verified by the Surveyor-General before they can be accepted as defining the lawful boundary.

- Evidence can be gleaned from rectified imagery and aerial photography in order to determine an approximate (i.e., 10 – 20 m) position of the high water mark and the extent to which rivers and estuaries are tidal.
  - The National Geospatial Information data now includes a 5 m contour line determined from its rectified imagery, which is very useful – in particular along the edges of estuaries. Prof. Gerrit Basson (2013, p. 14) notes that, at East London, “the 1:50 year and 1:100 year maximum tidal levels are estimated at 1,904 m and 1,984 m above MSL, respectively.” For tidal rivers and estuaries, therefore, a height of 5 m above MSL is considered sufficient to cover simultaneous high tides, closure of the mouth and a normal annual storm. Any determination of a high water mark or bank of a tidal river above 5 m must therefore be questioned.
  - In another survey undertaken by Professional Land Surveyor Mike Medcalf for the study of the Great Fish River also undertaken by Prof. Basson (undated), the maximum water level of the river remains more-or-less constant for 23 km upstream from the mouth, whereafter the river bed gradient tilts, indicating flow from the source only. Therefore, he has determined that the Great Fish River is tidal to about chainage 23730, or 23.73 km upstream.
  - The hard-wood vegetation line visible on rectified imagery and aerial photography is often an overly conservative determination due to the presence of sand dunes and drift sand above the high water mark. In general, it will only be useful along the sea shore and not up tidal rivers. Alternatively, there are some hardy mesophytic pioneers (quick-growing trees that feed off fresh water (Lubke and van Wyk, 1988, p. 11)) that spring up quickly within the flood plain, so their presence is not definitive.
The legal position of the high water mark is often obliterated by a “legitimate” position – such as the sea wall along Sea Point, Cape Town and the breakwater protects (“dolosse”) along Algoa Bay near Port Elizabeth, where man has intervened and created a feature that has become accepted as the high water mark.

Historic cadastral data (the original survey line) can also be used as a basis for determining the position, bearing in mind that:

- There have been inaccurate (over-conservative?) determinations
- Much of the data is old
- Some of the very old data has been sketched in by eye – without survey accuracy.

The final decision of the working session was that the following information should be used, in order of appropriateness, as a guide to determine a conservative position of the high water mark:

1) Accurate surveys based on the process set out in Williams-Wynn, 2012, i.e., surveys determined by professional land surveyors with the concurrence of the Surveyor-General in the last 5 years.
2) Accurate mathematical determinations based on the process set out in Mather, Stretch and Garland, 2011, i.e., determinations undertaken by municipalities to determine their high water marks, although these will still need to be verified by the relevant Surveyor-General in terms of the Land Survey Act, 1997.
3) Hardwood vegetation lines, visible on rectified imagery
4) 5 m contour lines as defined by National Geo-Spatial Information or other reputable sources of contour data.
5) “Legitimate” (man-made) features such as:
   a) Seawalls/breakwaters,
   b) Dolosse or other artificial defence structures (landward edge)
   c) Harbour walls
   d) Roads and railways (seaward side)
6) Other (older) cadastral data (original survey lines)
7) Other physical evidence, such as:
   a) Quick fieldwork – a hand-held GPS walk along the swash line of the coast or banks of a river
   b) Natural features visible from rectified imagery
   c) Historical aerial photography
Evidence on the ground

All of the above evidence is contributory, but not definitive of the actual position of the boundaries of the estuary or tidal river. The only way to determine an accurate position of the boundary at any point in time is for a professional land surveyor to carry out a field survey and collate the position of all the evidence. This position can then be confirmed with the Surveyor-General as being the position of the ambulatory boundary at that specific point in time.

A quick guide for the determination of the position of the boundary of a tidal river or estuary will include the following:

1) How far up-stream is the river or estuary tidal?
   a) Where is the ebb and flow? Is there historic data to complement or contradict the position being considered?
   b) Where is the water course no longer affected by the sea? I.e., the water is fresh from source only and not saline?
   c) Do the contour levels or spot heights taken of the high water levels contribute to the belief that the point chosen as the ebb and flow is reasonable?

2) What defines the banks of the river between the mouth and the ebb and flow?
   a) Is the high water mark evident?
   b) Is the flood plain between the two banks determinable?
   c) How do spot heights on the proposed banks compare with each other and the 5 m contour line?
   d) Has any “wetland adjacent to coastal waters that is regularly or periodically inundated by water, salt marsh, mangrove area, inter-tidal sand and mud flat, marsh, and minor coastal streams regardless of whether they are of a saline, freshwater or brackish nature” been excluded?
   e) If the estuary becomes closed to the sea, are there other areas that are regularly or periodically covered by water?

Summary

From the definitions of estuary and coastal wetland, it is evident that the high water mark is not the only line influencing the ambulatory position of the boundaries of tidal rivers and estuaries. Instead, the limits of a tidal river or estuary are defined by:

- The two banks,
- The mouth through the sea shore, and
- The so-called “ebb and flow” point, being the furthest reaches upstream of the influence of the sea, determined by the salinity of the water or the highest levels of normal annual tidal activity.
References

13. R.J. Peter, et al: “Working session to discuss the development and demarcation of an expert line to serve as the High Water Mark for an online system for the mapping of coastal boundaries and auditing of structures within the coastal public property” meeting at the offices of the Department of Environmental Affairs at the V&A Waterfront, Cape Town, on the 5 February 2013.

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