

IRWIN INLET SANDBAR OPENING PROTOCOL

July 2011

Responsible Agencies

The responsible agencies involved with the management of Irwin Inlet are the Shire of Denmark and the Department of Water.

The Shire of Denmark has management responsibility for all Council infrastructure and facilities. The Chief Executive Officer has delegated authority (Delegation D100501) to determine the location and level for the opening of the Irwin Inlet sandbar (Attachment 1).

The Department of Water has responsibility, in partnership with the community and other agencies, to manage the State's water resources, including Irwin Inlet. The Department monitors water quality in the inlet and responds to water quality issues such as algal blooms and fish kills.

Irwin Inlet physical features

Estuaries on the South Coast of WA are generally 'wave dominated' estuaries. These types of estuaries have sand bars separating them from the ocean, with the sand bar either permanently opened, naturally opened or artificially opened on a seasonal or less frequent basis.

Irwin Inlet is a shallow (maximum water depth approximately 2m), elongated lagoon approximately 5.5km long and 2.5km wide, lying behind the well-vegetated coastal dunes, parallel to Quarram Beach.

The inlet has a catchment of some 2,300km², which is approximately 30% cleared. The inlet is fed by the Bow and Kent Rivers. During low flow periods the Kent River may be estuarine at least as far as Owingup Swamp (5km from its confluence with the lagoon) and the Bow River may be estuarine for about 2km. The bar is often artificially breached in winter when water levels are high in the Inlet and typically stays open for about five months after breaching, although there have been two occasions since 1964 when the bar has reportedly stayed open for two to three years after a breach.

Sandbar opening issues

The sandbar has historically been allowed to open naturally or is breached by the Shire of Denmark to reduce flooding impacts on Peaceful Bay Road and adjacent private property.

The Shire of Denmark Chief Executive Officer has delegated authority to determine the time and location of artificial breaching of the Irwin Inlet sandbar, exercised in accordance with Council's adopted sandbar opening protocol (Attachment 1).

Shire of Denmark decides the location of the bar opening based on achieving maximum initial scouring of the channel and minimum erosion of the coast hills on the western bank of the channel.

The bar opening can also present a hazard to commercial fisherman and Bibbulmun track walkers, recreational fishermen and horse-riders using Doubtful Bay Beach, who should be pre-warned of the risk of the inlet mouth being open to the ocean.

Timing of opening

The timing of the bar opening is determined by water levels in Irwin Inlet, which is dependent on rainfall and river discharge. Tide patterns and barometric pressure systems are also given consideration. In a natural state, the bar would open in response to rainfall events, with openings occurring predominantly in winter and spring. With bar opening at this time, there is a likelihood of continuing rainfall replenishing water levels in the inlet, resulting in adequate water levels of the summer period to maintain ecological systems in a healthy state, as well remaining aesthetically agreeable to people.

However, an opening occurring in spring, summer or autumn can result in low water levels in the inlet persisting over an extended period. This can result in poor water quality outcomes with potential algal blooms and fish kills. Given that Irwin Inlet and Quarram Beach are popular recreational and commercial fishing areas, this is not desirable from a human health and amenity perspective.

IRWIN INLET SANDBAR OPENING CONDITIONS

Factors that are considered in determining the need to artificially open the Irwin Inlet sandbar are:

- Human safety concerns arising from traffic hazards caused by flooding of Peaceful Bay Road, which is currently the only sealed access road to the Peaceful Bay settlement;
- Achieving adequate inlet levels above mean sea level, to ensure scouring of the inlet mouth channel to allow for good inlet outflows, and sustained marine exchange for estuarine fish populations recruitment and breeding cycles;
- Ensuring the protection of Shire of Denmark Council road infrastructure;
- Limiting any negative impacts resulting from the flooding and inundation of surrounding adjacent farmlands.

Water height

Artificial openings of the sand bar occur due to high water levels in the estuary causing localised flooding and restricting access. It is unlikely that an opening would occur at a low inlet level, as low water levels do not result in any flooding of road infrastructure and associated human safety concerns.

Preferred water levels

The recommended range of water levels at which the Inlet Sandbar will be artificially breached by the Shire of Denmark Council, are as follows:

	Water height (m) as measured at the Irwin Inlet/Peaceful Bay Road flood gauge on Peaceful Bay Road located at: 116.94756° E (116°56'51"E); 34.99335° S (34°59'36"S)
Agreed level	0.600m
Absolute maximum	0.770m (road surface level)
Absolute minimum	0.440m (to provide for the protection of road subgrade infrastructure, and protection of inlet ecology)

It is unlikely that an opening would occur if minimum water levels are not reached during April to September. It is important that water levels in the estuary do not drop excessively during the summer and autumn of any year, as this can lead to poor water quality, characterised by low oxygen and hyper saline conditions. Such conditions can result in algal blooms and fish kills.

If summer or autumn (unseasonal) extreme rainfall events result in the requirement for a bar opening, consultation with the Department of Water is essential to assess the risks to the Inlet's ecological health. It may be necessary to consider other options to mitigate the effects of temporary high water levels in the inlet.

Timing

Sandbar openings should be timed to coincide with periods of higher river inflow to the Inlet, during the months from April to September. Timing must satisfy the need to achieve an effective opening whilst minimising property inundation and road damage.

Once the minimum sandbar opening level is reached (0.440m) and an opening looks imminent, factors that need to be considered to determine the specific time of sandbar opening in order to achieve effective water exchange are:

- Forecasts of rainfall and projected river flow for the period following the proposed time of opening;
- Wind speeds, weather patterns and oceanic levels due to tides and barometric pressures;
- Availability of staff to undertake the scheduled opening, and provide for the safety of other beach and Inlet user groups.

Further consideration needs to be given to any imminent storm or flood event warnings once the inlet has reached the absolute minimum level (0.440m), as heavy rainfall events can result in the inlet filling exceptionally quickly, and can also make the mouth inaccessible to undertake opening of the inlet for several days. A storm weather warning may require that procedure for inlet opening be undertaken as rapidly as possible.

(Forecasts for wind and tidal conditions can be accessed from the Bureau of Meteorology website - www.bom.gov.au. Wind speed predictions for up to 21 hours for three hour intervals should also be consulted.)

Sandbar opening location

The breaching of the bar at the mouth should achieve maximum initial scouring of the channel and minimum erosion of the coastal sand dunes to the west of the sandbar. The opening cut should occur at no less than 150m and no further than 250m from the sand dunes to the west of the mouth, in a straight line from inlet to ocean water line.

Water quality

If a sandbar opening is imminent, the Department of Water should be consulted to discuss water quality conditions and the likelihood of a negative environmental impact resulting from the bar opening.

SANDBAR OPENING PROCEDURE

Authorised Shire of Denmark staff/local Peaceful Bay landholders monitor water levels at the Irwin Inlet water level gauge on Peaceful Bay Road, and inform the Shire of Denmark CEO once minimum opening water levels are reached.



Shire of Denmark CEO determines that a sandbar opening is likely, due to flooding risk.



Shire of Denmark CEO or delegated staff to consult with Department of Water.



Department of Water to determine whether conditions are suitable for opening (current water quality conditions, stream flow).



Department of Water to advise the Shire of Denmark CEO of outcome.



- If conditions are suitable and the opening of the sandbar is to proceed, then the CEO will advise community and proceed as per the attached Delegation D1000501 (Attachment 1), taking into account any additional recommendations included in the Irwin Inlet Sandbar Opening Protocol.
- If conditions not suitable for opening but Shire of Denmark still proceeds with opening of the inlet, Shire of Denmark to be advised they are acting against the advice of the Department of Water.
- Shire of Denmark to continue to undertake actions to address flood management issues, including human safety, public liability and inundation of private farmland.

ATTACHMENT 1:**IRWIN INLET SANDBAR OPENING PROTOCOL**

DELEGATION NUMBER	-	D100501
LEGISLATIVE POWER	-	Local Government Act 1995
DELEGATE	-	Chief Executive Officer
ACTIVITY	-	Protection Environment

The Chief Executive Officer is delegated authority to determine the location and level for the opening of the Irwin Inlet sandbar. The delegation is to be exercised in accordance with the adopted sandbar opening protocol.

The Shire Chief Executive Officer advises stakeholders when water level reaches a level of 100mm below normal opening level (to be decided). Representing affected landholders will be the current owner of Location 1414. The president of the South Coast Licensed Fisherman's Association shall be the contact person for commercial fishermen. Any relevant information from stakeholders shall be considered when deciding opening location and water level, with the final decision being delegated to the Shire Chief Executive Officer.

Relevant Agencies & Stakeholders

Agency / Stakeholder	Email	Phone	Fax
Department of Water	kirsty.alexander@water.wa.gov.au	9842 5760	9842 1204
Department of Environment & Conservation Track's & Trails Unit	tracksandtrails@dec.wa.gov.au	9334 0265	9334 0100
Department of Environment & Conservation – Frankland District Office	Frankland.District@dec.wa.gov.au	9840 0400	9840 1251
Department of Fisheries	Mark.kleeman@fish.wa.gov.au	9841 7766	9842 1112
Commercial Fishermen – by contacting the President of the South Coast Licensed Fisherman's Association Inc.		0427 417 260	9841 7268
Affected Landholders (current owner of Location 1010)	Refer A5164 in Council records for contact details.		
The Bibbulmun Track Foundation	friends@bibbulmuntrack.org.au	9481 0551	9481 0546
Denmark Visitors Centre	manager@denmark.com.au	9848 2055	9848 2271
Walpole Nornalup Visitors Centre	wnta@wn.com.au	9840 1111	9840 1355
Peaceful Bay Progress Association	to186jo@westnet.com.au	9840 8242	

The Chief Executive Officer may on delegate this responsibility.

RECORDING REQUIREMENTS

Advice of decision is to be recorded on central records and in the Council's monthly Information Bulletin.

ADDED by Res: 363/07 & 364/07 / 16 OCTOBER 2007

