Sandbar Opening Policy –

Quarram / Irwin Inlet and Kordalup / Parry Inlet

24 November 2026 - Attachment 9.4a

Policy Statement

This policy establishes a consistent framework for the artificial opening (breaching) of sandbars at Quarram / Irwin Inlet and Kordalup / Parry Inlet to:

- Protect public safety and infrastructure from flooding
- Maintain ecological health of estuarine systems
- Provide clear governance and decision-making authority
- Ensure coordination with relevant agencies and stakeholders

Both inlets are wave-dominated estuaries that may open naturally but periodically require managed intervention.

Responsible Authorities

- Shire of Denmark is responsible for management of Council infrastructure and flood mitigation
- Department of Water and Environmental Regulation (DWER) is responsible for providing approval for inlet opening
- DWER (or successor agency) provides advice on water quality, ecological condition, and environmental risks and monitors estuarine health, including algal blooms and fish kill events
- Community Stakeholders (Kordalup / Parry Inlet) - The Parry's Beach Voluntary Management Group (PBVMG) contributes to local knowledge, monitoring, and consultation processes

Policy Principles

Sandbar openings will be guided by the following principles:

- Public safety priority where flooding impacts access or creates hazards
- Protection of infrastructure, including roads and essential services
- Environmental sustainability, maintaining water quality and ecological function
- Seasonal alignment, favouring openings during winter–spring flow periods
- Evidence-based decision-making, based on water levels and environmental conditions
- Consultation and transparency with agencies and stakeholders

Conditions for Sandbar Opening

Artificial opening may be considered where any of the below conditions are present:

- Flooding or imminent flooding affects critical access routes:
    - Peaceful Bay Road (Quarram / Irwin Inlet)
    - Parry Road (Kordalup / Parry Inlet)
- Public safety risks arise from inundation or restricted access

- Council infrastructure is threatened
- Adjacent properties or farmland are impacted
- Water levels are sufficient to achieve effective scouring and flushing

Water Level Triggers - Quarram / Irwin Inlet

Trigger Level	Water Height
Optimal	0.700 m
Maximum	0.970 m
Minimum	0.440 m

- Levels are based on historical observations and may be refined over time
- Openings below the minimum level are generally not supported due to environmental risks
- Gauge reference: Water level meter on Peaceful Bay Road
- Maximum trigger level reflects current road surface level.

Water Level Triggers - Kordalup / Parry Inlet

Trigger Level	Water Height
Optimal	1.2 m AHD
Maximum	1.25 m AHD
Minimum	1.0 m AHD

- Levels are based on historical observations and may be refined over time
- Gauge reference: Water level meter on Parry Road

Policy Review

This policy should be reviewed every 3–5 years, following significant flood or environmental events or when improved monitoring data becomes available.

Document Control Box			
Document Responsibilities:			
Owner:		**Owner Business Unit:**	
Reviewer:		**Decision Maker:**	
Compliance Requirements:			
Legislation:			
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Synergy Ref:		**Review Frequency:**	As required
Version #	**Date:**	**Action:**	**Resolution No.**
1.			

OPERATIONAL STANDARD

Sandbar Opening –

Quarram / Irwin Inlet and Kordalup / Parry Inlet

Standard Statement

This procedure outlines how staff monitor, assess, approve, and carry out artificial sandbar openings at Quarram / Irwin and Kordalup / Parry Inlets. It supports implementing the Sandbar Opening Policy.

Responsibilities

- Director Infrastructure and Assets – Makes the final recommendation to DWER on whether to open the sandbar.
- Manager Civil Infrastructure – Oversees assessment and implementation and engages a contractor to undertake excavation.
- Civil Infrastructure Staff – Conduct monitoring, site preparation, and install signage.
- Rangers – Public safety
- Community Engagement Officer – Manage notifications to the community.
- Parry Beach Representatives (Kordalup / Parry Inlet only) – Assist with monitoring, consultation, and cut alignment marking.

Monitoring and Trigger Identification – Civil Infrastructure / Parks and Reserves Staff

Water Level Monitoring is undertaken at the following locations:

- Quarram / Irwin Inlet: Monitor Peaceful Bay Road flood gauge.
- Kordalup / Parry Inlet: Monitor Parry Road gauge (picnic area)

Trigger Levels – Quarram / Irwin Inlet:

- Minimum: 0.440m AHD
- Optimal: 0.700m AHD
- Maximum: 0.970m

Trigger Levels - Kordalup / Parry Inlet:

- Minimum: 1.0m AHD
- Optimal: 1.2m AHD
- Maximum: 1.25m AHD

Initial Assessment – Civil Infrastructure / Parks and Reserves Staff

When minimum levels are reached, or flooding risk is identified, staff are to undertake a site inspection and report the observations to the Director Infrastructure and Assets.

- Water level - measuring the respective gauges, including photos of the gauges
- Road inundation
- Site access safety – beach area accessibility for heavy machinery
- Condition of inlet mouth (height and breadth of the bar)

Assess Risks and Conditions:

- Flood risk to infrastructure and property
- Rate of water level rise
- Forecast rainfall and inflows
- Ocean and tidal conditions

Check Forecasts:

- Bureau of Meteorology weather updates
- Wind, tide, and barometric conditions

Assess Timing: Preferred period: April to September (winter–spring). Openings outside this period may reduce water quality and increase ecological impacts. Consider:

- Rainfall and inflows
- Tidal and ocean conditions
- Wind and barometric influences
- Ability to achieve effective flushing
- Prefer opening near high tide
- Avoid dry-season openings unless required for flood risk

Decision to Proceed

The Director of Assets and Infrastructure will consult with Parry Beach Volunteer Management Group (PBVMG) and nearby stakeholders to confirm local observations, advise of the opening of the bar and seek their assistance where required. The Director of Infrastructure and Assets will consult with Parry Beach Volunteer Management Group (PBVMG) and nearby stakeholders to confirm local observations, advise on the opening of the bar and seek their assistance where required.

The Director of Assets and Infrastructure provides written communication to:

1. Key Stakeholders – current status of water level and intent to open with a proposed date, and what preparations the Shire will undertake for public safety. Refer to the contact list at the end of this document.
2. Department of Water and Environmental Regulation (DWER), seeking authority to proceed based on an approved location and time. Documentation should include:
    - Water levels
    - Flood impacts
    - Forecast conditions

DWER provides written confirmation to the Shire of Denmark to proceed with the bar opening and may provide additional terms to be met as part of the opening.

Opening Protocols (Civil Infrastructure)

Notify:

- Stakeholders and parties to inform (see list at the end of this document)
- Emergency services (if required)
- Shire Community Engagement Officer (e.g. website, social media)

Safety Measures:

- Install signage at beach access points and crossings
- Define the worksite
- Identify hazards for fishers, Bibbulmun Track users, and vehicles and request Rangers to undertake a sweep of the area to ensure people are not stranded as a result of the bar opening.

Site Preparation:

- Quarram / Irwin Inlet:
    - Select location 150–250 m from western dunes
    - Ensure straight alignment
- Kordalup / Parry Inlet:
    - Confirm and peg location with PBVMG

Excavation:

- Use appropriate machinery (e.g. excavator)
- Cut a straight channel from the inlet to the ocean
- Safe exclusion zones are established

Location:

Plan location for opening based on…

- Maximise channel scouring
- Minimise coastal dune erosion (especially western dunes)
- Quarram / Irwin Inlet: Typically, 150–250 m from western dunes

- Kordalup / Parry Inlet: Determined with PBVMG and stakeholders

Post-Opening Management

- Confirm breakthrough, observe flow rate and channel stability
- Track public safety hazards. Install shark-warning signage at the opening for 5 days.
- Watch for fish kills, water quality decline or algal blooms and report concerns to the DWER.

For each opening, record:

- Date and time
- Water levels and weather conditions
- Consultation undertaken
- Decision rationale
- Photos (before and after)
- Any incidents or issues

Stakeholders and Informed Parties

Informed		
Organisations/Individuals	**Email**	**Phone**
The Bibbulmun Track Foundation	friends@bibbulmuntrack.org.au	9481 0551
Walpole Nornalup Visitors Centre	info@walpole.com.au	9840 1111
Peaceful Bay Progress Association **(Quarram / Irwin Inlet)**	secretary@peacefulbayprogress.org.au	
Peaceful Bay Caravan Park **(Quarram / Irwin Inlet)**	info@peacefulbaywa.com.au	9840 8060

Stakeholders		
Organisations/Individuals	**Email**	**Phone**
Department of Water & Environmental Regulation	southcoast@dwer.wa.gov.au	9841 0100
Department of Biodiversity Conservation and Attractions Recreation & Trails Unit	recreationandtrails@dbca.wa.gov.au	
Department of Biodiversity Conservation and Attractions – Frankland District Office	Frankland.District@dbca.wa.gov.au	9840 0400
Department of Primary Industries & Regional Development – Marine & Fisheries	cso.albany@dpird.wa.gov.au	9892 8444
Parry Beach Voluntary Management Group **(Kordalup / Parry Inlet)**	parrysbeach@gmail.com	
Current leaseholder of portion of Reserve 20928 (L Pinniger) **(Kordalup / Parry Inlet)**	Local Fisher, Refer to Council records for contact details (A2678)	
Stephen Rule **(Quarram / Irwin Inlet)**	Local Fisher	[redacted]
Paul Benson **(Quarram / Irwin Inlet)**	Local Fisher	[redacted]

Document Control Box

Document Responsibilities:			
Owner:	Manager Civil Infrastructure	**Owner Business Unit:**	Civil Infrastructure & Waste Operations
Reviewer:	Director Infrastructure and Assets		
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P100513 **IRWIN INLET SANDBAR OPENING PROTOCOL**

Council adopted the *Irwin Inlet Sandbar Opening Protocol* for when the sandbar requires artificial breaching to reduce flooding impacts on infrastructure and/or adjacent private properties.

The Chief Executive Officer has delegated authority to determine the location and level for the opening in accordance with the Protocol. Refer to Delegation D100501.

A copy of the Irwin Inlet Sandbar Opening Protocol can be found at Appendix 4.

Appendix 4

IRWIN INLET SANDBAR OPENING PROTOCOL

February 2012

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.

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 2,300km^2, 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.

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.

<u>Water height</u>
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 Delegation D1000501, 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.

P100514 **PARRY INLET SANDBAR OPENING PROTOCOL**

Council adopted the *Parry Inlet Sandbar Opening Protocol* for when the sandbar requires artificial breaching to reduce flooding impacts on infrastructure and/or adjacent private properties.

The Chief Executive Officer has delegated authority to determine the location and level for the opening in accordance with the Protocol. Refer to Delegation D100505.

A copy of the Parry Inlet Sandbar Opening Protocol can be found at Appendix 5.

Appendix 5

PARRY INLET SANDBAR OPENING PROTOCOL

January 2013

Responsible Agencies

The responsible agencies involved with the management of Parry 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 D100505) to determine the location and level for the opening of the Parry 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 Parry Inlet. The Department monitors water quality in the inlet and responds to water quality issues such as algal blooms and fish kills.

Parry Inlet Physical Features

The catchment of Parry Inlet is relatively small, just over 100km², of which at least 80% of is cleared farmlands. The approximate total area of the inlet is 1.6km^2, and the estuary is very shallow over most of its extent (<0.5m deep), being deepest in the mouth channel (max 2m). The inlet is bordered by Shire of Denmark reserve (R20928, Purpose: Camping and Recreation) and adjacent privately owned land to the west, and the William Bay National Park (Department of Parks and Wildlife managed estate) to the east.

The estuary is wave dominated, and as such the bar would breach naturally most years. Currently, the sandbar is opened artificially once water levels have risen sufficiently in the inlet. In the past, this has been indicated by inundation of nearby paddocks and flooding of Parry Rd. Recently a gauge board has been installed at the picnic area opposite 298 Parry Road. This will be used to indicate the appropriate water level that must be reached prior to breaching the bar. Artificial openings to the sea occur each winter, remaining open for a few weeks to a couple of months at a time.

The estuary suffers anoxic and hypoxic events and can dry out in some years. Shallow waters will become hyper saline as the waters evaporate.

Sandbar Opening Issues

The sandbar is currently breached by the Shire of Denmark to reduce flooding impacts on Parry Road and adjacent private property. Shire of Denmark decides the location of the bar opening in consultation with the Parry's Beach Voluntary Management Group (PBVMG).

Location is based on achieving maximum initial scouring of the channel and minimum erosion of the coast sandhills on the western bank of the channel. The channel is pegged by a representative of the PBVMG prior to excavation commencing.

The timing of the opening is a joint decision made by the Shire of Denmark, adjacent landholders and the PBVMG. The bar opening can present a hazard to recreational fisherman, Bibbulmun track walkers and other beach users on Parry Beach, who should be pre-warned of the imminent opening of the sandbar, or of risks once the inlet is open to the ocean.

Timing of Opening

The timing of the bar opening is determined by water levels in Parry 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 during winter or spring. With bar openings at this time, there is a likelihood of continuing rainfall replenishing water levels in the inlet, resulting in sustaining water levels into the summer period to maintain ecological systems in a healthy state. However, as Parry Inlet is very shallow over most of its extent, hyper saline and hypoxic events have been observed during dry periods.

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.

RECOMMENDED SANDBAR OPENING CONDITIONS

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

- Human safety concerns arising from traffic hazards caused by flooding of Parry Road, which is currently the only sealed access road to Parry Beach campsite and Hillier Bay;
- Achieving adequate inlet levels above 1.0m AHD to ensure scouring of the inlet mouth channel to allow for good inlet outflows, and sustained marine exchange for estuarine fish population 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.

<u>Water Height</u>

A staff gauge to measure water height was recently installed near the picnic area approximately 2 kms along Parry Road. This has been tied to AHD using the Landgate marker on the opposite road verge. The PBVMG have been monitoring the water height and determined at this stage the optimal, maximum and minimum levels estimates as outlined in the table below. In future, the optimum height will be confirmed by using levels recorded by the PBVMG over a period of time. This document will then be reviewed and the appropriate levels incorporated.

The estimated optimal, minimum and maximum are provided in the table below. These estimates relate to the water levels recorded just prior to the bar opening in 2012.

Optimal	1.2m
Maximum	1.25m
Minimum	1.0m

It is unlikely that an opening would occur if inlet levels persist below the minimum opening level beyond winter months, as low water levels would not cause road infrastructure flooding problems, but would be likely to impact negatively on the condition of 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 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:

- Daily tide readings to ensure opening is conducted at the peak/end of the high tide to allow optimal initial flushing from the Inlet;
- Wind speeds, weather patterns and oceanic levels due to tides and barometric pressures; and
- Availability of staff to undertake the scheduled opening, and provide for the safety of other beach and Inlet user groups.

(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 PBVMG and local professional fishermen in consultation with the Shire of Denmark decides the location of the bar opening. Location is based on achieving maximum initial scouring of the channel and minimum erosion of the coast hills on the western bank of the channel. A volunteer from PBVMG pegs the location before excavation commences. Signage will be erected by the PBVMG in the vicinity of the pegs 24-48 hours prior to the opening to inform beach users of the imminent opening.

SANDBAR OPENING PROCEDURE

Parry's Beach Voluntary Management Group members monitor
Inlet water levels at the Parry Inlet water level meter on Parry Road, and inform the Shire of Denmark CEO once minimum opening water levels are reached.

⇩

Shire of Denmark CEO will, in consultation with a PBVMG delegate, determine that a sandbar opening is required due to flooding risk.

⇩

- If conditions are suitable and sandbar opening is to proceed, then the CEO will advise community (List of stakeholders: Attachment 1) and proceed, taking into account any additional recommendations included in the Parry Inlet Sandbar Opening Protocol.

- Shire of Denmark to continue to undertake actions to address flood management issues, including human safety, public liability and inundation of private farmland.