

# Huia Domain: Erosion Management Options

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# *Presentation Outline:*

1. Historical context and current situation.
2. Management options:
  - CMS research completed to date
  - Typical seawall repairs / extension
  - Managed realignment (options)
3. Muriwai Beach case study:
4. Summary:
  - Feedback sought
  - Process moving forward

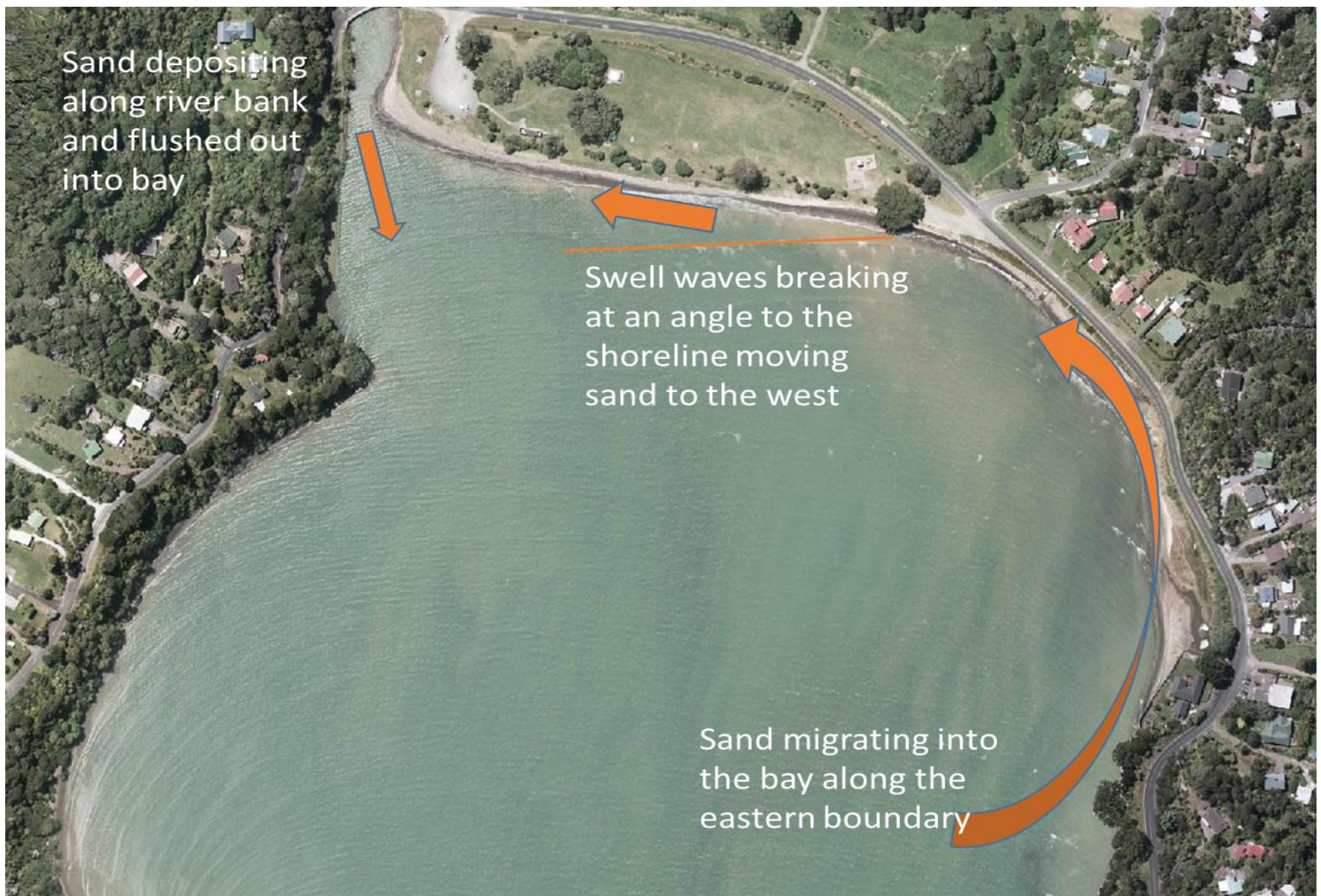
- Redirection of road access
- Provision of coastal defences (seawall)
- Realignment of coastal interface (beach)

**1940**



**2010**





- Swell propagation and refraction into bay (during heavy SW swell)
- Above reinforced during extreme tides
- Combination of heavy swell and extreme tides results in erosion



- Highest tides in ~14 years (on average).
- ~4 x 1/100 year storm events over last 12 months.



19/08/2014



19/08/2014

- Pronounced end effects (turbulence)





# Research Completed:

- 2012 (May): CMS options report completed confirming an erosional phase and options for monitoring and planting adjacent to toilet block.
- 2014 (Jan): Tonkin and Taylor (T&T) report confirming a range of typical management options.



*3 x 1/100 coastal storm events across the Auckland region*

- 2014 (Sep): CMS and T&T report confirming requirement to complete short term repairs to seawall (but option for innovative treatment).
- CMS update to LB confirms reinforced pattern of erosion and 2 main options for repair (seawall repair or managed realignment).

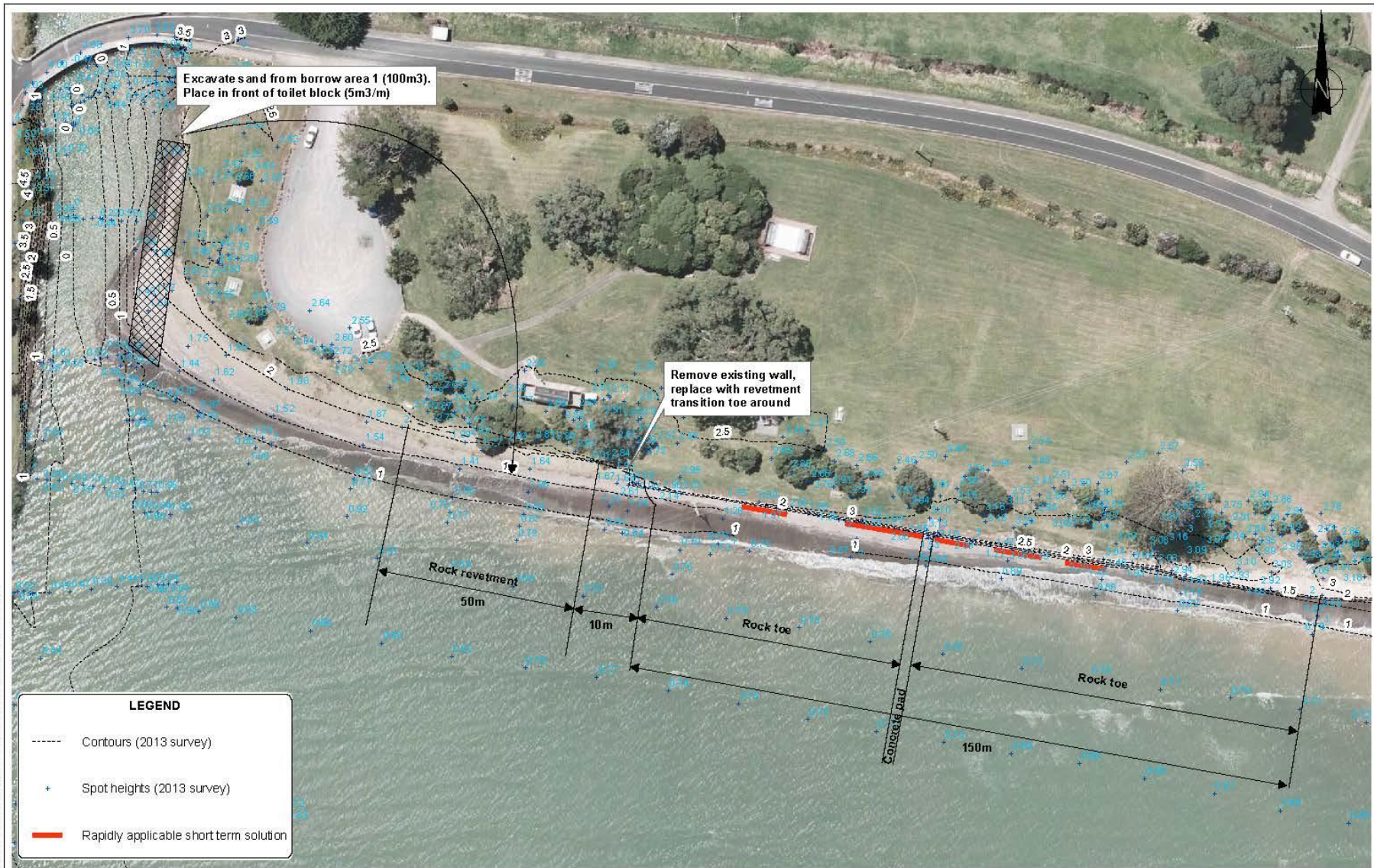
# *Management Options:*

## Seawall Repairs:

- Provision of rock riprap along the base of existing seawall.
- Western extension of seawall past toilet block (to provide limited protection).
- Provision of fill and improved drainage immediately landward (obviate scour during overtopping events).
- Targeted beach sand redistribution (from west to east) to provide buffer and improve amenity).

## Limitations:

- Initial capital and ongoing maintenance costs (over 35 years) in the order of ~\$420,000.
- Decreased amenity, access and related use of beach area.
- Inability for structures to compensate for related effects of climate change and sea level rise (30cm / 50 years).



Notes: Auckland Council GIS imagery

A3 SCALE 1:750

0 10 20 30 40 50 Meters



**Tonkin & Taylor**  
Environmental and Engineering Consultants  
105 Carlton Gore Rd, Newmarket, Auckland  
www.tonkin.co.nz

DRAWN	PPK	Sep.14
CHECKED		
APPROVED		
NOTES		
Short-term solution.mxd		
SCALE (KTA3 SEE)		
1:750		
PROJECT NO.	29394	

**HUIA BAY**  
Refined issues and options assessment  
Short term solution

FIGURE NO. Figure B1

Rev. 0

# *Management Options Continued....*

## Managed Realignment:

- Removal of existing seawall and relocation of high value infrastructure to restore a natural coastal edge and related coastal processes (including sediment redistribution).
- Improved access, amenity and related use.
- Improved ability for beach to respond to storm events and related effects of climate change and SLR.
- Diminished requirement for active maintenance (structural repairs).
- Ability to stage works with removal of infrastructure as required.

## Limitations:

- Acceptance of requirement for removal of some trees and relocation of high value infrastructure (playground, carpark and possibly toilet block).
- Initial capital costs in the order of ~\$470,000 but no enduring maintenance costs.



## *Muriwai Beach (2005) Management Realignment (case study)*





# MOTUTARA SOUTH CARPARK RECONFIGURATION

REV 2 25.03.09 MN

- Car park pulled back 40 metres from existing edge
- Car park reconfigured working within existing kerbing (61 cars)
- Dune graded back to new car park configuration to allow beach views
- Ground / bank / dune contoured back down to beach
- Motutara Road retained as pedestrian only access to beach & Flat Rock as well as emergency & Fishing Club access
- Stream eventually to be daylighted to head down reformed gully



SURF CLUB BUILDING

Develop pedestrian access through to north.

Informal pedestrian access through to north carpark (no vehicular access)

MURIWAI BEACH

Short term carparking & beach viewing lookout.

Recontoured sand dunes graded back & planted dependant on final configuration

Stormwater pipes to be retained in the short term

Pedestrian access to beach across recontoured dunes.

TOILETS  
SEALED CARPARK

PLAYGROUND

Safer pedestrian access from playground to beach, Flat Rock & Gannet Colony.

Short term carparks and lookout to remain open as long as practical and safe given the ongoing erosion issues.

Emergency vehicle access & fishing club access until impractical due to erosion.

Motutara Road retained for pedestrian access to Flat Rock & Gannet Colony, emergency vehicle access & Fishing Club access until impractical due to erosion.

ROCK WALL (TO REMAIN)

NATURAL ROCK SHELF

0 10 20 30 40 50 (m)





(2005)



(2011)



(2005)



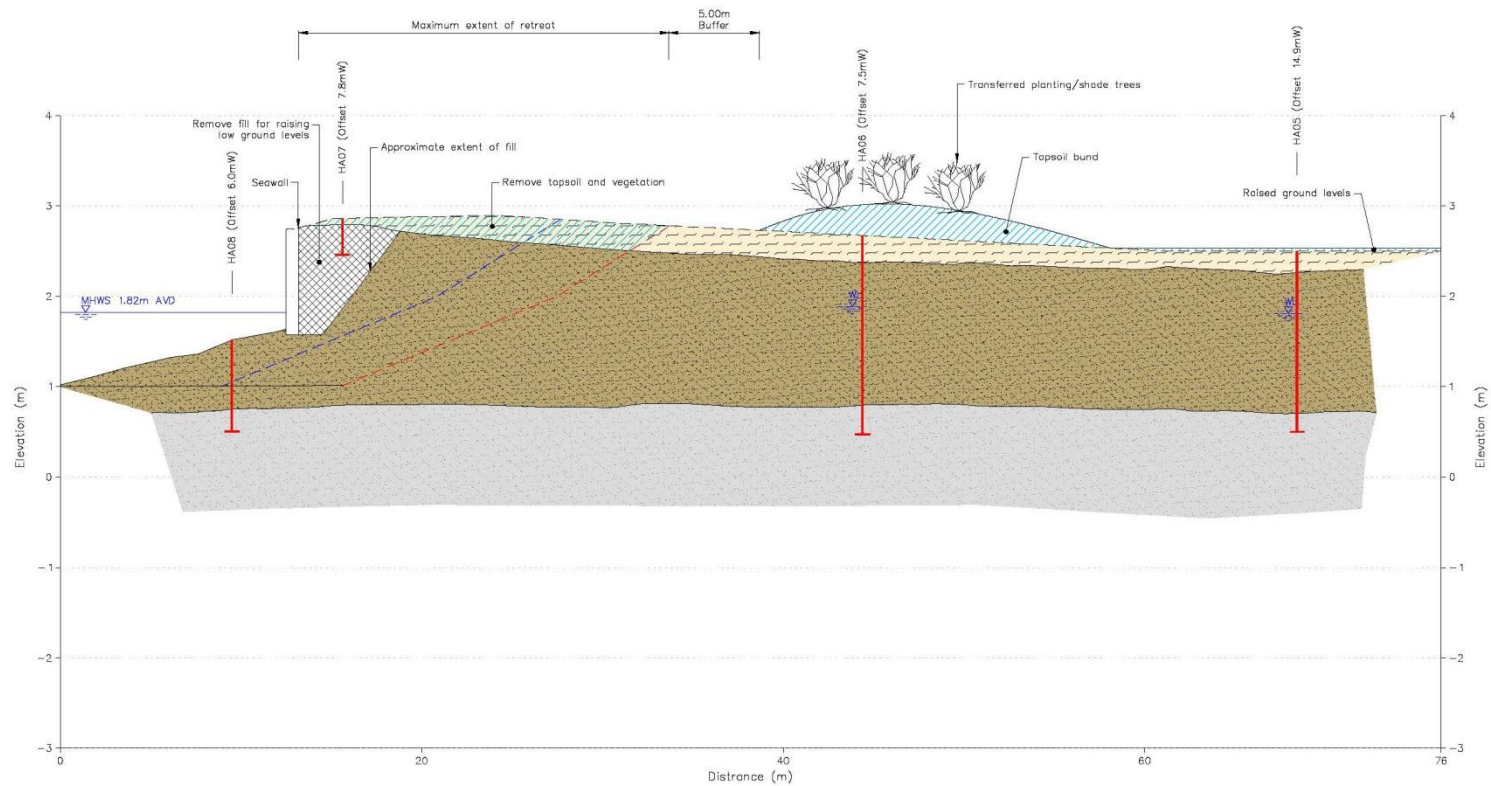
(2011)



Areas of work

16/09/2011





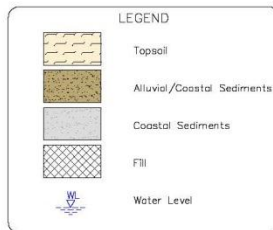
SECTION 1  
SCALE 1:250 (H)  
1:50 (V)

NOTES:

1. All dimensions are in metres unless noted otherwise.

A3 SCALE 1:50 (V)  
0 0.5 1.0 1.5 2.0 2.5 (m)

A3 SCALE 1:250 (H)  
0 5 10 15 (m)



ORIGINAL IN COLOUR

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DRAWN	JIC	Nov. 14
DRAFTING CHECKED		
APPROVED		
CADFILE 1		
29394-F02.dwg		
SCALES (AT A3 SIZE)		
As Shown		
PROJECT No.		
29394.0010		

**AUCKLAND COUNCIL**  
HUIA DOMAIN MANAGED REALIGNMENT  
Geology & Typical Section  
FIG. No. Figure 2  
REV. 0

# *Managed Realignment (Options)....*

Several design options available:

**A. Comprehensive Option:** Removal of existing infrastructure (seawall) and manual reconfiguration of reserve (earthworks) to ensure all infrastructure landward of expected shoreline readjustment.

- Includes removal of toilet block and some trees, with relocation of eastern playground.
- 15 – 25m set back (loss of ~4,000m<sup>2</sup> of grass reserve)
- Refer **RED** dashed line

**B. Limited Intervention:** Removal of existing infrastructure (seawall), targeted reconfiguration of reserve (earthworks) and provision of offshore structure to provide limited protection to toilet block.

- Includes removal of some trees and relocation of eastern playground.
- Loss of ~1,500m<sup>2</sup> of grass reserve
- Refer **GREEN** dashed line

# *Where to from here.....*

- Coastal process assessments completed to date confirm Huia Domain experiencing a phase of erosion (the timeframes of which are uncertain).

## Seawall:

- Existing seawall has failed (in certain areas) and requires comprehensive maintenance/upgrades, including an extension past the toilet block.
- If the seawall is to remain, ongoing maintenance will be required for duration of coastal permits (35 years).
- Requirement for maintenance may increase substantially in response to the related effects of climate change and sea level rise.

## Managed Realignment:

- Managed realignment has ability to restore a natural coastal interface.
- Essentially one off capital cost with little/no enduring maintenance.
- Ability to respond and compensate for the related effects of climate change and sea level rise.

# Conclusions...

- Community feedback sought on preferred management response to enable detailed design and costings to be presented to the Local Board.
- Refined design(s) to be presented back to the community with supporting information related to program of works and phasing.

## Questions?

