

**Submission to Busselton City Council:
Proposed Structure Plan for Newport,
Port Geographe**

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1. Background

By email of 6 December 2018 from Senior Strategic Planner (Helen Foulds), on behalf of Director of Planning (Paul Needham), the City of Busselton advises that the Proposed Structure Plan (Newport Geographe) is currently out for public consultation, with the submission period closing on 19 December 2018. Port Geographe Landowners Association Inc (PGLOA) is invited to comment.

Details we have consulted are included in the several appended draft adverts at:

<https://www.busselton.wa.gov.au/Developing-Busselton/Public-Consultation/DP180001>

The principle concern in this Structure Plan relates to the surface-water management proposals that attempt to prescribe minimum finished floor levels (FFL) for residences at 3.8m AHD, which implies 3.7m AHD for finished land levels (FLL).

PGLOA has an interest in the continuing development of the Port Geographe precinct, and is concerned about any actions that may compromise its vitality. Consequently it makes this submission to express its concerns.

2. Aigle Proposal

Despite Stage 1 of the Newport Geographe development having recently reached completion, further development of Newport Geographe is still subject to the original Port Geographe Development Plan of 2005. Consequently any variation requires a new structure plan.

Aigle Royal has submitted to BCC a proposed structure plan for the next stage of Newport Geographe development. This will formalise the overall plan to develop mostly dry lots with appropriate public open space (POS), as distinct from canal lots and artificial lakes of the previous developer. This concept has been well publicized and accepted by all parties for the last five years, but now significant conditions are sought to be imposed by BCC and State Planning Commission whilst development is in progress.

Amongst many other requirements, the proponent Aigle is obliged to consider the guidelines of State Planning Policy 2.6 – State Coastal Planning Policy 2013, which requires provision for storm inundation and projected rise in sea levels.

Aigle has provided reports by consultants 360 Environmental (Jan 2018) and Jim Davies Associates Hydrological (JDA, Oct 2017), seen at Advert 5 of the above link. The JDA report noted a 1.45 metres storm surge above normal tide level for the 100-year event, and 0.4m AHD for sea-level rise to the year 2070, totaling 1.85meters, would be compliant with the requirements of SPP 2.6.

Aigle has proposed a minimum FFL of 2.5m AHD, although it is not clear how this was constructed from the individual components.

It is relevant to note that the now-completed Stage 1 of Aigle proceeded on an agreed finished ground level (FGL) of 2.85m AHD, which translates to a finished floor level (FFL) of 2.95m AHD.

3. BCC Response

The initial statement by the respondent (and delegated authority) BCC is seen at *DP18/0001 Advert 11 Delegated Adoption Report*:

Concerns were raised in regard to short-falls in the target 10% for public open space (POS). However the major comment of BCC was a preferred minimum FFL of 3.8m AHD. This value is based on a report by Department of Transport (DoT) in January 2018 and endorsed by Department of Planning Lands and Heritage (DPLH) that says FFLs should be set *above the 1 in 500 year storm surge event in 100 years time*.

This figure of 3.8m AHD is made up of the 500-year Average Recurrence Interval (ARI) of 2.9 metres plus the Intergovernmental Panel on Climate Change (IPCC) projected rise in sea level of 0.9 metres to the year 2110. This sums to a FFL of **3.8m above AHD**.

4. PGLOA Concerns

It is understood developer Aigle cannot countenance such an imposition. PGLOA is concerned that this current stand-off will create investor uncertainty to the extent that development at Port Geographe may once again be stalled. This would depress property prices and ratable values and tarnish the image of Port Geographe, which is one of the jewels in the crown of the City of Busselton.

It would be a tragedy if the current development lapsed because of overly prescriptive and unrealistic regulations.

It must be remembered that most of the buildings of Busselton, including the new Council House, as well as undeveloped titles throughout the City, have FFLs well below the mooted 3.8m AHD.

Port Geographe already has the most elevated residential land development in the City of Busselton. Unjustified imposition of the new standard is unfair, discriminatory and out of touch with reality.

SP2.6 offers guidelines to the planners which are not legally prescriptive. Based on technical and scientific grounds, there is scope for COB to proscribe balanced and sensible FSLs for Newport Geographe Stage 2, as well as other properties in Port Geographe.

5. Flaws in the DoT Recommendations

In regard the inundation component, we note that the consultant reports on behalf of Aigle are significantly less than those preferred by BCC. PGLOA believes the one in 100-year scenario is more appropriate than the 500-year scenario, because the replacement age for today's houses is well within the 100 year time frame.

Also, a surge level based on a 500-year average recurrence interval (ARI) is not consistent with practice in relation to other sources of water, elsewhere in the State. Typically a 100-year ARI flood event is used for defining development boundaries near rivers.

There is a very significant difference in height between the levels for 100-year and 500-year events, and we question the ability to quantify this in view of the fact that useful meteorological records go back only 120 years. Beyond that, PGLOA makes no comment on the quantum.

However there are serious flaws in the recommendation in relation to the sea-level rise.

The DoT recommendation of Jan 2018 invokes a figure of 0.9m for sea-level change based on the review of sea level change in WA by Bicknell (2010). This relied on projections from the IPCC AR4 (2007), which is now superseded by IPCC AR5 (2014). Importantly there is an extra decade of new data to consider. To be fair, Bicknell did recommend reconsideration after the next IPCC review which will be AR6 due 2019. This is now a necessity.

Some areas for reconsideration are listed below, all of which were discussed by Bicknell (2010).

5.1 Sea Levels from Tide Gauges

Records from more than 2,000 tide gauges around the world, dating back to 1870 are a useful indicator of climate change, despite the many acknowledged difficulties in making precise estimates from some of the data. Subsidence relating to engineered structures, dewatering

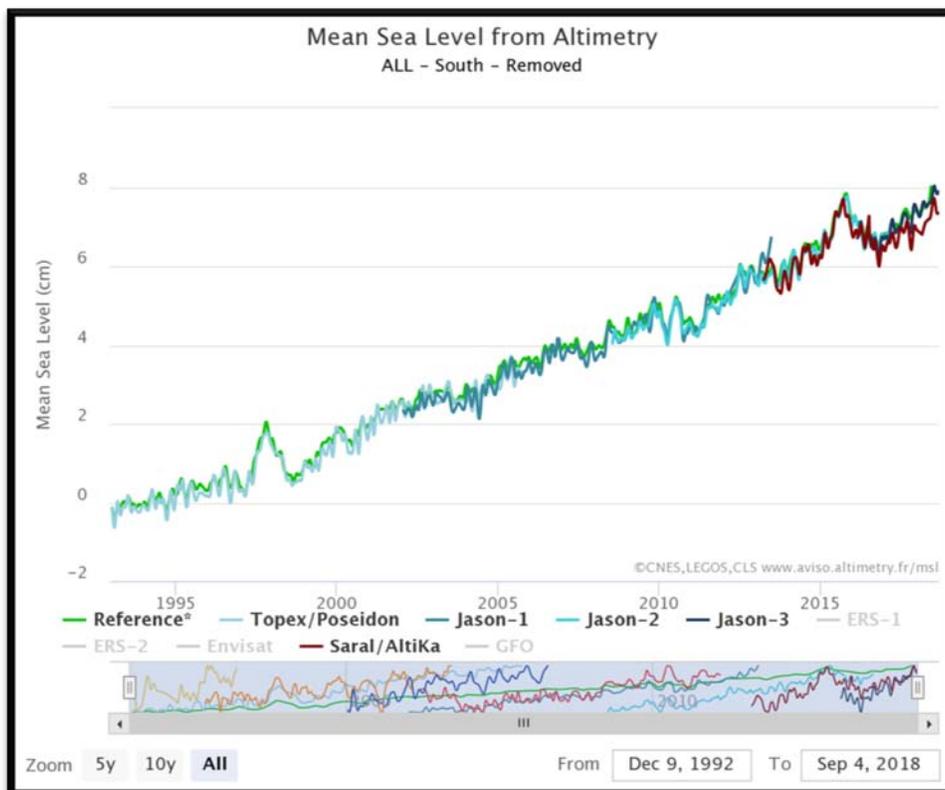
and sediment compaction are common causes of over estimating sea-level rise. For example Bicknell (2010) chose to use the alarmingly high rate of 7.2mm/y for Hillarys, which was an off-shore marina development in 1986 that was subject to initial seabed subsidence. That dataset has been discredited and must never be used again in this context.

The figure used by Bicknell (2010) for global sea levels from tide gauges is **1.7mm/y over the last 110 years**, based on Church and White (2006), which has been updated by Church and White (2011) and adopted by IPCC AR5. This global figure is basically unchanged to date, except that the mooted acceleration is not evident.

The accepted figure is 1.7mm/y over the last 110 years which gives a realistic perspective to the actual sea-level rise. It is one tenth of IPCC projections. It is relevant to note there is general agreement that the major contribution to this rise is thermal expansion of water related to the global rise in temperature of 0.65⁰C per century (IPCC AR5).

5.2 Satellite Altimetry

Satellite altimetry is more reliable than the problematic tide gauges. Bicknell (2010) used Aviso 2009 data to derive a figure of 3.32mm/y, but there is nearly another decade of new data with new satellite platforms, which now covers the time period of the existence of the IPCC.



Aviso 2018 Satellite altimetry for Southern Hemisphere - Dec 1992 to Sep 2018

Aviso (2018) data in the above figure shows the sea-level rise for the Southern Hemisphere for the period Dec 1992 to Sep 2018 (25.85yrs) is 7.35cm, which equates to 2.84mm/y. This is significantly less than the figure advocated by Bicknell. It is generally accepted that satellite imagery is more reliable than tide-gauge records that must filter out major El Nina-type events that have amplitudes in the decimeter range.

The current figure equates to an actual rise of only 0.28 meters per century. Moreover there is no evidence for any acceleration of sea-level rise as was popularly claimed at that time. In fact there is emerging evidence of a slowing rate, as noted by Boretti (2012), and shown in recent satellite data.

These figures can be checked at:

<https://www.aviso.altimetry.fr/en/data/products/ocean-indicators-products/mean-sea-level/products-images.html>

5.3 IPCC Predictions

IPCC projections are based on complex computer models using the laws of physics but modified by subjectively selected positive feed-back factors that modify the estimated forcing factors for carbon dioxide. Despite the fact that successive Assessment Reports have repeatedly lowered their sea-level predictions (and temperature predictions for that matter) issued since IPCC AR1 in 1991, IPCC predictions have never matched reality. In all cases they have over exaggerated reality. In fact IPCC have never attempted to calibrate their numerical models with actuality over the last quarter of a century. Failed computer models are not a proper basis for making important strategy decisions.

Even more inappropriate was the raising of the predicted rise of 0.38 metres (being the median value in the IPCC AR3 prediction in 2001) to 0.9 metres to match the upper bound in AR4 in 2007. This was done on presumptions of accelerating rates that have subsequently proven false.

IPCC AR5 (2014) invokes various positive radiative forcings for carbon dioxide for different atmospheric carbon dioxide concentration, relating to three emission scenarios (low, medium and high). It then computes lower and upper confidence bounds for these three scenarios. To be truly objective when applying IPCC predictions, the **median** bound of the **middle** scenario (RCP4.5) should be used. This equates to 0.45mm/y (0.45m/century). To use the upper bound of the upper scenario (which incidentally is 0.82m/century) is unjustified, alarmist and potentially damaging.

5.4 Continental Movement

The greatest flaw in the Bicknell recommendation is its blanket application of 0.8m for the whole of Western Australia. It is clearly demonstrated by geological and new-generation coastal tide gauges that the Australian continent is tilting north as it collides tectonically with the Indonesian volcanic arc. Continental Australia is moving north at 7cms per year – the

fastest tectonic plate on Planet Earth – for which there are consequences well within the 100-year time frame.

Port	SL Change mm/y
Wiepa	3.5
Groote Eylandt	5.2
Darwin	2.6
Port Hedland	1.8
Geraldton	1.2
Fremantle	1.6
Bunbury	0.9
Albany	0.9
Victor Harbour	0.8
Geelong	1.2
Hobart	-0.4
Sydney	0.8
Mackay	1.5
Townsville	1.3

The tilting is reflected in the adjacent table that shows the sea levels of the northern ports (Wyndham, Darwin, Groote Eyland, Weipa) are rising at a seemingly alarming rate. Conversely the ports along the south continental coast (Bunbury, Albany, Victor Harbour, Hobart and Sydney) are all below the global average noted in Sections 5.1 and 5.2. The trailing edge of the Australian continent within the Australian tectonic plate is actually rising over geological time.

The most obvious reference marker for Geographe Bay is the 51-year tide records for the port of Bunbury which indicates a mere rise of 1.22mm/year, equivalent to **0.12 metres per century** (Haig et al, 2011)

Sources NTC BOM 2012, 2014
Uncorrected for ENSO and GIU

6. Geotechnical Consequences

Current canal walls have been designed with a minimum 6-metre setback for buildings, for a FGL of 2.75m AHD. This imposes constraints on raising lot levels where walls are already constructed.

Raising the lot levels to about 3.7m AHD will require a setback for house pads of 12m to 15m to avoid the risk of instability for the existing canal walls.

7. Appropriate allowances

Component	Allowance metres
Mean sea level Busselton	0.2
Normal tide	0.4
100 year ARI storm events	1.5
Sea level rise	0.3
Freeboard (incl finished floor)	0.3
TOTAL	2.7 metres

Based on experience and actual data, the appropriate allowances are shown in the adjacent table. The 0.2m component is the difference between AHDm0 and Busselton mean sea level, which incidentally is the reason for adding the additional “half block” onto the designed canal walls. The sea level rise of 0.3m is in the mid range of the medium emission scenario of RCP4.5 (IPCC 5AR, 2013)

The total of 2.7m AHD accords with past practice. In effect there is no need to change any parameters.

8. Conclusions

State Planning Policy 2.6 – State Coastal Planning Policy 2013 is out of date in regard to measuring and forecasting sea-level rise, and does not provide a suitable guide to developments in different coastal segments of Western Australia, specifically Busselton.

Coastal management must rest upon knowledge of local geological, meteorological and oceanographic conditions that are specific to the location.

Provision for a one-in-500-year ARI event is taking the precautionary principle to unjustified extremes. The 100-year ARI event is much more consistent with the likely replacement time-frame for all buildings in Busselton, and even then it can be overly precautionary in some situations.

Global averages from tide-gauges or the satellite estimates of global sea-level have little useful application to coastal management in specific locations.

Recent satellite altimetry gives no evidence for any acceleration in sea-level change, and therefore provides no justification for choosing the upper confidence bounds of the high emission scenario.

The application of a blanket increment of 0.9 metres for future sea level rise over the next century for the whole of the WA coast is clearly erroneous, considering the tectonic tilting of the Australian continent.

The IPCC suite of CMIP computer models in the entire sequence of Assessment Reports since 1991 have been consistently wrong when tested against factual data; therefore they cannot be relied upon as a tool for formulating important coastal management policy.

The likely rise of sea levels in Geographe Bay over the next 100 years, based on empirical observations such as tide records of Bunbury Port (0.12m/century), does not justify a major planning response that threatens the disruption of the social and economic fabric of Port Geographe, and indeed all of Busselton.

The prescription of a 3.8m AHD for future residences in Port Geographe will likely disrupt current and future development plans in the precinct, tarnish the image of Port Geographe and destroy landowner wealth, for no beneficial outcomes.

BCC should use its discretionary powers to come to a sensible and realistic decision on new block elevations, which should equate 2.8m AHD.

9. Acknowledgements

This submission is compiled using the professional scientific, engineering, geotechnical and planning expertise within the Port Geographe Landowners Association.

Specifically it draws on the life-time professional experiences of:

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Ron McDavitt, Assoc WAIT, FIE Aust, MIET

Geoff Cocks, BEng, MSc Civil Eng

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