Jane Nees
Deputy Chair
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12 February 2014

I strongly disagree with the direction that is being publicly notified by Pim de Monchy and your Council engineering staff. Your staff have been handicapped in their ability to come up with anything better by your Council insisting that Te Tumu exit remains unchanged. Reintroduction of Kaituna River flow through Maketu Estuary yet again through Fords Twin Cuts could never be a complete success because:

1. It would leave two shallow and unsafe Kaituna River entrances instead of one deep safe original Kaituna River entrance through Maketu Estuary via Papahikahawai Channel, and also with some flow to the south of Papahikahawai Island.

2. Original Kaituna River catchment ecosystem food chains could never be completely recreated because galaxius spawning would remain at the top of the salt water wedge in the limited Kaituna River habitat and away from the original extensive Maketu Estuary maritime marsh galaxius spawning habitat that can be recreated in the upper Maketu Estuary. Therefor recovery of the local inshore coastal and fresh water tuna fishery food chains would always be restricted by using Ford's Twin Cuts for reintroduction of Kaituna River water into Maketu Estuary.

3. The toe of Maketu Estuary spit would continue to be eroded from behind and would be destabilised by current flowing around the back or southern side of Maketu Estuary in isolation from a significant original protective Papahikahawai Channel flow, which would stop the trajectory of the southern flow from bending against and eroding the back of Maketu Estuary spit. This would be the same mistake that had happened two decades ago when BOPRC had insisted on reintroducing Kaituna River water to Maketu Estuary via Fords Twin Cuts under the guidance and manipulation of Chris Richmond of DOC in collaboration with Barry Wilkinson of Maketu. It was a complete failure as I had predicted in the Appeal Court and in preceding years of correspondence with DOC and BOPRC that it would be. The Appeal Court judge had asked me what proof that I could provide the court with that what I was predicting would occur. I can now provide that proof with time sequence photographic evidence. Following the Appeal Court hearing and when I had noticed exaggerated erosion of the back of the toe of Maketu Estuary spit occur, I had visited Fords Twin Cuts and I saw that newly installed flap gate structures had been opened and had been sabotaged to remain open. This was well before the recorded official opening date.

I answer points in Pim's letter as follows:

Paragraph 2: An overtopping weir at Te Tumu could be only high enough to stop low tide Kaituna River flow exiting at Te Tumu and not high enough to adversely affect gravity drainage upriver. It could be a flat or slightly v-shaped concrete pad about the

size of the Waiari Stream State Highway 2 road bridge for example. It could incorporate a triangular concrete structure on the seaward end of it so that it would stop the majority of any high tide storm surge from overtopping it. The triangular structure could be shaped to reflect high tide storm surge up into the air and back onto itself. The triangular shape could also direct high tide Kaituna River fresh water flow exiting at Te Tumu towards the seaward end sides of the overtopping structure so as to maintain beach sand scour in readiness for Kaituna River flood relief if necessary, and without cost and without any ongoing maintenance being required.

Kaituna River flood capacity at a Te Tumu concrete overtopping weir that would have sand only on its sides would remain unchanged from what it is now because any flood could and would quickly erode sand adjacent to the weir as well as emptying through Papahikahawai Channel and through Fords Twin Cuts into Maketu Estuary.

The next high tide that followed a reduction of Kaituna River flood flow would quickly replace sand as Kaituna River fresh water would again flow more easily downward into Papahikahawai Channel and downward through Ford's Twin Cuts into Maketu Estuary for the approximate 4 hours that Maketu Estuary would be lower than the ocean and or the Te Tumu overtopping weir. As the tide rose and as Maketu Estuary filled the overtopping weir would again carry Kaituna River flow and wave washed beach sand would then fill any scour adjacent to the weir.

The volumetric weight of the salt water ocean does have significantly more force than does fresh Kaituna River water that can only flow on top of the ocean because salt and fresh water do not readily mix (Please see attached photographic evidence of this), and so ocean waves would quickly rebuild the beach at the side of the overtopping weir at Te Tumu effortlessly and without cost. The overtopping weir would continue to carry high tide Kaituna River flow and so would maintain Te Tumu entrance ready for flood relief whenever required and without cost.

Kaituna River high tide flow would continue to fill Maketu Estuary with 100% fresh water through Papahikahawai Channel and through Fords Twin Cuts on top of a salt water wedge that would be entering through Maketu Estuary mouth, until Maketu Estuary water level was as high as the overtopping weir at Te Tumu. Kaituna River fresh water would then exit at Te Tumu over the overtopping weir and until Maketu Estuary had again partially emptied through the tidal cycle.

As the tide receded and Maketu Estuary emptied again at Maketu, then 100% Kaituna River fresh water flow would re-enter Maketu Estuary through Papahikahawai Channel and through Ford's Twin Cuts and the Kaituna River catchment food chains would continue to rebuild based upon Maketu Estuary maritime marsh galaxius spawning habitat to be recreated.

The more Kaituna River water purifying wetlands that are recreated upstream of Maketu Estuary maritime marsh galaxius spawning habitat, that can be quickly regrown in a predominantly fresh water environment, then the greater will be the potential rebuild of local inshore coastal fisheries commercial production food chains at Maketu. This could then demonstrate how inshore coastal fisheries commercial

production and fresh water tuna (eel) production could be increased from similar works nationwide.

I believe that our inshore coastal fishery commercial production can be increased exponentially and it could be more efficiently harvested annually without destroying spawning potential, juvenile fish and marine habitat. This could result in ongoing increasing national wealth. I believe that this could now be demonstrated by BOPRC at Maketu. Ref www.wetlandsnz.com/Background/Funding Application - 2012 with background letters.

Please note my points of explanation re Te Tumu weir design in my attached letter to Steve Everitt dated 12/2/14.

Kindest regards

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