STAFF REPORT

TO: Development Contribution Levies – Delegated Committee

FROM: Development Engineer

REFERENCE: RM070323

SUBJECT: **B HANNA - REPORT EP08/10/12 -** Report prepared for meeting of 20 October 2008

Addendum to Staff Report EP07/04/07 from the Development Engineer

1. INTRODUCTION

Attached to this report is a short report dated October 2008 from Eric Verstappen, Council's Rivers and Coast Scientist.

In the conclusion of that report Eric states there may well be other reasons that contributions are required for drainage improvements. That is to undertake "drainage improvement works so as to provide uniform capacity and integrity, improve capacity to reduce flood risk"…..

My previous report explained that this area had flood waters covering the site in previous years (1986, approx 1 in 20 year event) and these are shown on Council flood maps .

The stormwater contribution map attached to my previous report also outlined the catchment contributing to stormwater systems servicing Richmond and where this locality drains to.

Councillors will be fully aware of the Borck Creek catchment (where this locality drains to) as this was outlined in the recent hearing for the 900 residential lot application in Richmond West.

Councillors will also be aware of the recent proposed rezoning of Richmond West and the $4,218,000 budget required to complete the Borck Creek upgrade from Lower Queen Street to State Highway 60 and that the capital work will need to be funded by Development Contributions received through subdivision or developments on the identified UDA land.

As mentioned in my previous report I commend developers who wish to carry out low impact designs (LID) in subdivisions and developments and we are seeing more of this in new applications to Council. As discussed at the August 2007 Engineering Services Committee, Council's new 2008 Engineering Standards have included a drawing/diagram where a detention/retention tank is sized for individual properties and showing concept rain gardens, swales and tanks. The Environment & Planning Department is also considering possible changers to the TRMP to promote "low impact designs". Both these initiatives will lead to low impact designs becoming more common for subdivisions and building developments in the future. There is no suggestion of any reduction in Development Contributions where low impact designs are used.

The prominent capital works located in the catchment that the applicant is developing is in Borck Creek. Council has started to upgrade Borck Creek and is proceeding steadily with land purchase and subsequent upgrade from the estuary heading upstream.

Ultimately once Borck Creek is upgraded all residents in the catchment will "benefit" as flooding of surrounding properties will not then occur "up to a Q_{50} and Q_{100}" event. Note – the applicant's land presently floods in extreme events. Ie 1986 storm event.

One of the key aspects of development contributions is that those who "benefit" are required to fund the infrastructure caused by growth. Viz-(1.2, page 55, Purpose of Policy. "The key purpose of the Development Contributions policy is to ensure that growth, and the cash cost of infrastructure to meet that growth, is funded by those who cause the need for, and benefit from, the new or additional infrastructure, or infrastructure of increased capacity")

This application is required to be considered carefully as other examples from developers may well be presented for waivers or refunds. The following example illustrates this point further.

Example 1 – A 136-lot subdivision is proposed in Stringer Road. The applicant is presently applying for consent to supply water on a temporary basis via deep water bores on their site. Their bore and supply have a proposed life of 10 years until the coastal pipeline is laid in the area from the Motueka supply (presently under resource consent application). Should the private temporary bore water supply provided by the developer be permanent then will the developer be required to pay a development contribution towards the coastal pipeline? If they are given a waiver then who will fund the outstanding amount not collected?

Example 2 – Two-lot subdivision in Gladstone Road – a pipe stormwater system is available in Gladstone Road near Jubilee Park and will require connection across the State Highway (Transit). The applicant is proposing soakage for the roof and paved areas. Will the applicant be granted a waiver from development contributions for stormwater when we know there are very high ground water conditions in the area and the property lies within the catchment that drains to Poutama Drain and Borck Creek?

The Hanna proposal is to provide soakage to ground for the 2255m^2 buildings.

Soakage can drain in a downward direction – either down through the soil and or in a sideways direction. In some areas of the province, such as Stoke in Nelson soakage may be adequately disposed of up-slope but I am aware that in Tennyson Crescent subsurface water comes to the surface in the form of surface springs (ie, therefore horizontal soil/layers) causing problems for Council and the landowners, ie moisture under houses.. Similarly with the applicant's proposal, soakage cannot be disproved to come out at the invert of the adjacent drain (may well happen at present) and also via the stormwater overflow pipe which will be constructed as part of the design. Therefore more concentrate subsurface flows may be directed to this drain than previously experienced.

I am aware that the building consent has been issued for the greenhouse and shed and therefore Council has lost the opportunity to place conditions on the property (ie, no resource consent required). However under rule 36.4.2 (k) (iii) soakage would be a permitted activity if the ground water was greater than 2.0m below ground and I am unaware if this has been verified by the applicant.

It appears that the discharge of storm water to ground was a permitted activity at the time and therefore no ability for Council to:

a) Monitor the soakage field – that it works and is maintained in the future.
b) Restriction on the area set aside for the disposal field ie no build area.
c) Enforce that the area will always be available for the soakage activity.

2. CONCLUSION

The applicant has proved that disposal of stormwater from the roof areas can be achieved via a soakage trench system and this has been confirmed by Eric Verstappen however accurate details of ground water levels in mid winter have yet to be defined.

If everyone were self-sufficient in regard to their own services on site, ie, soakage, composting toilet/septic tank, bore water then who will provide the systems to mitigate existing flooding, contamination of aquifers problems due to growth etc. Hence the imposition of the services and UDA boundaries

It is recognized that many parties "benefit" by system upgrades and the contributions made towards a flood free environment where low impact designs are used on existing substandard catchments. This should be accounted for fairly by new developments within the catchment. I have therefore revised my recommendation as set out in my report of 5 September 2007. As the property <u>is</u> located within the stormwater service contribution area and that the owners <u>will</u> benefit in the long term by having a flood free environment, my recommendation is:

3. RECOMMENDATION

THAT the full stormwater development contributions are payable on this application, ie 7 HUDs (fraction raised to nearest whole number).

Dugald Ley
Development Engineer

Eric Verstappen – Resource Scientist Rivers and Coast

1. BACKGROUND

Mr Hanna proposes to extend his greenhouse complex on a site located on White Road. Borck Creek runs through the site. I understand the property lies within an area from which development contributions are levied for stormwater management purposes. I was asked to review the stormwater mitigation measures designed by Mr John McCartin for the applicant, and assess to what extent, if any, stormwater runoff to from the development to Borck Creek exceeds the runoff from the site in its pre-development state. I understand that a LID stormwater soakage trench system is proposed so as to reduce or eliminate the need to make a stormwater development contribution.

2. ASSESSMENT

Mr McCartin has designed a stormwater management system for runoff from the proposed greenhouse complex. He has modeled two rainfall scenarios, being the 20% and 2% AEP, and compared runoff outcomes for the pre-development and post-greenhouse development scenarios. The greenhouse has an area of 6000 sq.m and is proposed to be built on pastureland. Assessment of rainfall infiltration rate of the underlying soil strata was undertaken by thoroughly irrigating the proposed soakage site, followed by a soakage test. This information, along with ground cover characteristics, was then input into his runoff model, to calculate the pre and post runoff states.

The fundamental question is whether, in the long term, additional runoff from the proposed development will enter the adjacent Borck Creek drain compared to the pre-development situation. In a pastoral situation, when rainfall intensities exceed infiltration rates to ground, some runoff will occur. This usually occurs during higher intensity rainfall events. The present ground surface layer has an infiltration rate that is less than the underlying, less compacted, more porous materials that the proposed soakage trench penetrates. The soakage trench is designed to reduce direct runoff to surface drainage and thus runoff from the proposed development does not add to peak flow rates in the drainage systems in the area. However stormwater discharged to ground via soakage will potentially add to the base flow rate in nearby drainage channels, if those channels are deeper than the soakage trench.

In assessing the effectiveness of the proposed stormwater runoff mitigation measure, a key factor affecting the performance of a soakage system is groundwater levels at the site. No evidence is produced in the application that supports Mr McCartin's assurance (pers. comm.) that, to his knowledge, groundwater levels at the site are ever high enough so as to either reach the underside of the proposed 0.9m deep soakage basin, or to adversely affect the performance of the system he has designed.

I cannot confirm whether this is the case, as no groundwater monitoring has been undertaken in the area, particularly in a wet winter. Council records do not show any bores on the property or immediate vicinity that may have been monitored or otherwise could provide some indication of groundwater level variability. A bore some 300m to the southwest only has 2 summer groundwater levels recorded in Council records, both exceeding 2m depth. Thus there is an element of uncertainty as to maximum groundwater levels at the site. Given experience of high groundwater levels elsewhere on the Hope Plain, it is entirely possible that high groundwater levels could also be experienced at this site, particularly during a prolonged wet winter.

As noted earlier, the soakage trench penetrates into a soil/granular layer that has a higher infiltration capacity than the surface soils. Even so, runoff input to the trench can exceed the infiltration capacity of the trench in the modeled rainfall scenarios. Mr McCartin has been a little conservative in his assessment of infiltration rate of the soakage basin, allowing for a 33% redundancy factor over the actual rate. For the 20% and 5% AEP (5 year and 20 year return period on average) scenarios modelled, calculations show that once infiltration rates are exceeded, runoff rates to surrounding ground (and potentially to Borck Creek) in the post-development state still remain less than for the pre-development pastoral state.

This outcome assumes that the infiltration rate of the underlying soils is not diminished in any way and that groundwater levels remain below the base of the trench. If groundwater levels are higher than assumed and penetrate into the soakage trench itself, the effectiveness of the system reduces and increased runoff to the drain from the trench occurs.

Information on groundwater levels has neither been provided in the application, nor otherwise confirmed. If groundwater levels rise and penetrate into the 0.9m deep trench, which is possible in a wet winter, then it is unlikely that the soakage trench will completely and satisfactorily attenuate stormwater runoff from the buildings and increased runoff to adjacent drainage will likely occur.

Council has records that indicate that the applicant's property has been affected by overland floodwater flow arising from insufficient capacity of the Borck Creek drainage system upstream of the site. While some drainage improvement works have occurred, more are necessary and are planned for the catchment as a whole. There is no reason to believe that such flooding risk has not been reduced or removed, through works undertaken to upstream drainage systems. However, when surface water flooding occurs, rainfall on the property will simply contribute to that overland flow, with no significant difference as to whether the site is covered in grass or additional greenhouses. Effects of a flood event completely dominate any rainfall contribution to runoff from the proposed development. However, the very reason a stormwater development contribution is being sought is to enable Council to undertake works to address the flooding issue that the property continues to be subject to and the resolution of which it will benefit from.

Reducing the effects of runoff from proposed developments to pre-development levels simply maintain the "status quo" situation. Runoff from the property to the drainage

network is still occurring and requires the presence and continued maintenance of a drainage system within the catchment. There are also existing drain capacity issues in the catchment that require addressing. This is to reduce existing flood hazard risks within the catchment and to the property itself. Despite a possible reduction in direct flow input to the drainage network from the proposed development to below pre-development levels, the property nevertheless will be a direct beneficiary of planned channel upgrading works (and thus flood risk reduction), and a contribution to the cost of this work is warranted.

3. CONCLUSION

Having examined the applicant's stormwater mitigation measures proposed for the greenhouse complex, I am satisfied (subject to there being no elevated groundwater influences on system performance) that no additional rainfall runoff will be contributed to Borck Creek from the proposed greenhouse complex compared to the pre-development state, for the 2% and 20% AEP rainfalls modelled. Thus, if development contributions are being levied solely on the basis of the amount of additional peak flow contributed to the drainage network, then none need be charged for this reason.

However, it is uncertain whether groundwater levels at the site will always be below the soakage trench level, as no monitoring of the site or vicinity has been undertaken. Higher groundwater levels will reduce the mitigation capacity of the proposed system, potentially to the point that little if any mitigation of proposed additional flows occurs. There are other reasons why a development levy may continue to be charged, even if no additional water is being contributed to a system. They include drainage improvement works so as to provide a uniform capacity and integrity to the drainage network, to reduce flood risk, or simply for maintenance of a public system. Some or all of these works are planned for this catchment, including above the subject property, from which the applicant will benefit.