9th June 2021

For the attention:
Liam Jukes
Senior Planner – Major Assessment
City Development Branch
Council of City of Gold Coast

Dear **Liam Jukes,**

Objection submission COM/2019/81 -

Updated 'Stormwater Management Plan' problems and observations

Please accept this objection as it highlights that the latest 'Stormwater Management Plan' dated 25th May 2021 is, in my opinion, not acceptable and uncovers a number of significant issues.

This objection, I believe, further highlights that the development application is proposing lowering the water table for an area of up to 6,313,673 square metres and pumping between 28 and 38 litres (of possibly contaminated) leached groundwater into the Coomera River every single second of the day 365 days per year for the next one hundred plus years!

Model assumptions are based on best case scenario

The Model Assumptions state: *"To present a water balance model considered to represent the site (in lieu of comprehensive information), certain assumptions have been applied. These are outlined below: … As suggested in the Groundwater Impact Assessment - Oxenford Quarry Extractive Boundary Realignment Project (G1913)(AGE 2018) and supported by G1913A: Oxenford Quarry Response (AGE 2019): "The inflow predictions show that the inflows are dominated by groundwater entering through the pit floor. The inflows predicted by the low bedrock conductivity scenario (total of 4 L/s or 130 ML/yr) are considered more likely to be representative of the magnitude of inflows to be observed during operations"* and *"Based on this statement, the groundwater inflow as anticipated at being 4 L/s (345.6m^3/d) for the quarry Pit Sump C3 for the ultimate site conditions"* (Attachment A1).

However, in the Groundwater Impact Assessment the low bedrock conductivity scenario is merely the best case option at '130 ML/yr'. In the case of 'High bedrock conductivity' there is an estimated '180 ML/yr' and in the case of 'High bedrock wall and floor conductivity' there is an estimated '432 ML/yr'. (Attachment A2) or 13.7 L/s. A significant difference from the *"Based on this statement, the groundwater inflow as anticipated at being 4 L/s (345.6m^3/d) for the quarry Pit Sump C3 for the ultimate site conditions"*.

I do not believe calculations can be based on *"low bedrock conductivity scenario … are considered more likely to be representative of the magnitude of inflows to be observed during operations"*. Clearly this is a mere 30% of the inflow than could be observed. Without actual proof that it is safe to assume this 'best case scenario' then the 'worst case scenario' should be adopted. Why is there a best case scenario and a worst case scenario if the applicant is just going to pick the best option? It would thus seem, this Stormwater Management Plan is based on the assumption the inflow from the pit floor and pit walls is going to be a mere 30% of the worst case scenario. Hardly a solid foundation to a ‘Stormwater Management Plan’ when you are assuming the groundwater inflow is going to be 3/10th of what may be witnessed.

Similarly, the ‘Radius of influence’ is going to be assumed to be 700 metres (best case scenario) whereas it could just as easy be 1.418 km (worst case scenario) as clearly shown in Attachment A2. Again, hardly a solid foundation to a ‘Stormwater Management Plan’ when you are assuming the ‘Radius of Influence’ is going to be an area of 1,538,600 m^2 , around the quarry, when in fact it could be an area up to 6,313,673m^2 (Which is over four times the size and incorporated hundreds of additional homes and businesses throughout the area).

Environmental Significance - wetlands and waterways

It is noted on the Gold Coast City Plan that there is an environmental significant waterway running from the eastern ridgeline to the Coomera River above the current approved footprint, as shown in the City Plan Interactive map: *‘Environmental significance - wetland and waterways’* overlay (reproduced in attachment B1).

It is also noted this is highlighted in the Stormwater Management Plan in Fig 2-4, *‘Existing Topography and Drainage of the Site’* (reproduced in attachment B2).

However, it is also noted that this waterway will be destroyed under the current DA proposals as clearly shown in the Stormwater Management Plan in Fig 2-3, *‘Proposed Future (Ultimate) Extraction Boundary’* (reproduced in attachment B3).

Are the Gold Coast City Planners aware that this freshwater supply route to the Coomera River, that is protected by the current approval, will be destroyed by the proposed development application?

This area is, as defined by the ‘Water Act 2000’, an area favouring riparian vegetation, which is, as described by the Queensland government: *‘Riparian vegetation is an important component and driver of wetland systems’* (Attachment B4).

It is interesting to note that ‘Flash Floods’, as are notorious in and around the Nucrush quarry site, and the John Muntz Bridge (destroying it three times in the last ten years) and the Coomera Weir a few metres downstream, are: *‘caused by drivers (e.g. high rainfall) and components (e.g. vegetation, soil, impervious surfaces) which interact … The right catchment vegetation and riparian management can reduce the speed and volume of water entering the river system’* (Attachment B4).

Are the Gold Coast City Planners sufficiently qualified to make a decision to permit the destruction of areas highlighted on the City Plan as *‘Environmental significance - wetland and waterways’*? Or should an expert be independently commissioned on behalf of the Gold Coast Council to establish the effect of altering environmentally significant waterways?

Water Usage

It is interesting to note that in the original Stormwater Management Plan the outflow of water (water surplus to needs) is shown as 24.3% for Dam 5 (Attachment C1). However, the updated Stormwater Management Plan shows this as now increased 35.7% (Attachment C2). They are both based on the water use details specified in Table 2-1 (as shown in Table C-4, attachment C3). It can be seen that the ‘Water Use Details’ in Table 2-1 are identical for both the original submission (Attachment C4) and the updated sub mission (Attachment C5). Why has the outflow of water changed so dramatically, given the water usage details appear to be identical? This is just one case noted between the different versions of this updated document. There is, it would seem, insufficient details in the Stormwater Plan to justify these changes or indeed validate their accuracy.

Is the Gold Coast City Planners willing to accept figures that it would seem are plucked from thin air?

Discharge into Coomera River

It is worrying to note that, based on the 'Stormwater Management Plan' submitted, Table C-8: *'Outflows from the site - Ultimate Site Conditions'* shows that between 2,437 cubic meters and 2,525 cubic metres (dependant on concrete production) will be discharged into the Coomera River on a daily basis (Attachment D1). This is also confirmed in Table C-10: *'Flow distribution onsite - Ultimate Site Conditions'* (Attachment D2).

This is over 100 cubic metres of water every hour on a 24 hours a day, 7 days a week basis. This equates to 1700 litres per minute or 28 litres of water per second (approx).

However, it should be remembered this is based on the 'best case scenario' of 130 ML/yr inflow into the pit i.e. A low bedrock conductivity. If it were found to be a high bedrock conductivity up to 432 ML/yr would flow into the pit (Attachment A2). Thus, there would be an additional 302 ML/yr inflow into the quarry pit (which equates to roughly 10 litres per hour) which would have to be pumped into the Coomera River as the quarry has no use for this additional ground water. Therefore, I believe, the outflow would increase to an estimated 38 litres per second on a 24/7 basis (approx)

It should be remembered, that it would seem, there are no settlement pits or containment pits other than Sump C3 in the later stages of quarrying. If this discharged water is found to be contaminated as I believe is expected (for example by acid sulfates or pyrite) how is this going to be decontaminated before release? Where will this volume of water be stored prior to release? It cannot be stored in Sump C3 as this will be forever filling with yet more potentially contaminated groundwater.

Quarry Pit Sump (Sump C3)

It would seem, from Table2 (page 134) of 'Stormwater Management Plan' that the volume of 'Sump C3' is in the region of 40,542 m^3 :

Table 2: Required Storage prior to storm event

Waterbody	Volume (m^3)	Depth (m)
Quarry Pit Sump	40542	5.3
Quarry Pit	79182	0.4*

**Assuming uniform depth over quarry pit floor. Alternatively, a sump could be constructed of equivalent volume*

It is envisaged that between 130 ML/yr and 432 ML/yr of ground water will enter the pit (Attachment A2). Assuming a worst case scenario, this equates to 432,000 m^3 /yr or 1,180 m^3 per day. Thus the 'Sump C3' would take in the region of just 34 days to fill up.

Once it has filled there will be a significant excess of groundwater leeching into the pit that will require discharge to the Coomera River on a 24/7 basis or the quarry pit will become unworkable.

If this groundwater has become contaminated (as I suspect it will) as a result of the quarrying operation releasing acid sulfates, etc. there will be nowhere to store this excess water to allow its decontamination before release and I can only surmise contaminated water will be pumped into the Coomera River on an ongoing semipermanent 24/7 basis.

The effects on our local ecosystem could be dire.

Discharge to Coomera River under disclosed

In the *'Schematic diagram of Recommended Stormwater Management Practices'* - Figure 3 it can clearly be seen that it is claimed there will be a discharge to the Coomera River of 90.69 ML/yr (reproduced in Attachment E1). However, this is a distinct contradiction to Table C-8 which shows the discharge to be between 933 ML/yr and 890 ML/yr (Attachment D1).

Why is this diagram seeking to convince the reader the discharge to the Coomera River is less than 10% of the actual figure?

Updated 'Stormwater Management Plan' dated 25th May 2021

It is also noted this latest version of the Stormwater Management Plan has been submitted over eighteen months after public notification had closed. Do the changes incorporated require a new public referral, just as the changes did with when the two hundred and eighty three pages of changes were submitted in February 2021? Is this change going to be brushed under the carpet just as the February changes were and all the former changes since public notification closed back in November 2019 have been?

It is noted there are some significant changes from the original Stormwater Management Plan with regard to inflows and outflows changed for what appears to be no quantifiable reason. Are you going to ask the applicant to explain these changes?

Outflows from the site - Ultimate Site Conditions (Table C-8)

The Outflows from the site, as shown in table C-8 (reproduced in Attachment D1) indicates the *'Average daily flow (m3/day)'* is between *2,437m^3* and *2,525m^3*, which is described as: *"Quarry Pit Sump C3 - Total outflow to polishing pond[5]"*, where [5] is specified as: *"Actual discharge to Coomera River will be reliant on the capacity within the respective polishing ponds at the time of receiving outflow waters from the quarry (I.e. Quarry Pit Sump C3 and Sediment Basin C8)"*. Unfortunately, I believe, this statement does not make any sense as it should be realised that at this stage in the development the *"Sediment Basin C8"* no longer exists (having become part of the extractive footprint as per attachment D3), therefore, it would seem, all the *"Quarry Pit Sump C3 - Total outflow"* will be pumped into the Coomera river despite Table C-8 inferring otherwise.

<u>Conclusion</u>

This development application, it seems, is proposing lowering the local water table for up to 1.418 km radius of effect and will be drained down do 110 metres below the Coomera River (and possibly, I believe, contaminated on route) and then simply pumped into the freshwater fishing/swimming lake on the Coomera River at between 28 to 38 litres per second on a 24/7 basis for 365 days per year.

That's up to '38 litres' of possibly contaminated water every single second 365 days per year for the next one hundred plus years!

How will the local ecosystem be affected by the discharge of such a large volume of water (possibly contaminated) on a daily basis into the Coomera River?

Will this have an effect on the thousands of properties and businesses within the cone of effect? Have they even been considered? Will the upstream aqua park and wake park be affected? Is there a possibility of sink holes occurring in the affected area?

How will bore owners in the vicinity be compensated if their bore runs dry as a result of this highly controversial lowering of the water table?

Is such an extreme effect on the water table by one polluting company in the vicinity acceptable to the Gold Coast Council?

How can it be acceptable to severely lower the water table for an area of up to 6,313,673 square metres and then to simply dump this freshwater (by now maybe contaminated due to the quarrying process) into the Coomera River where it is simply washed out to sea?

It would appear that this 'Stormwater Management Plan', as indeed the rest of the development application, does not bear well to scrutiny. And, it would seem this quarry has outgrown its current location.

Thank you in anticipation,

Kind regards

<u>Tony Potter</u>

* Disclaimer. Please note my findings are believed correct and are to the best of my ability. However, there may be errors and assumptions I have made that are incorrect. I do not believe this to be the case, but, realise with the vast amounted of submitted data from the applicant, errors and assumptions on my part may occur. Hopefully this is not the case, but please accept my apologises if this is so. Thank you.

Attachment A1 - 'C5.1 Model Assumptions' - best case scenario adopted

Oxenford Quarry Stormwater Man... 54 / 136 80%

C.5.1 Model Assumptions

To present a water balance model considered to represent the site (in lieu of comprehensive information), certain assumptions have been applied. These are outlined below:

- It has been assumed that quarry operations occur for six days per week, i.e. from Monday to Saturday inclusive.
- No increase in water use demand (with the exception of the 3 concrete production use scenarios presented) is anticipated during the ultimate site conditions.
- Capacity is constantly provided within the concrete batching area to cater for the 'first flush' event in accordance with exiting approvals.
- All heights presented in reduced level (RL) m Australian Height Datum (AHD) are best estimates based on data provided.
- The capacity of the waterbodies supplied in the concrete batching area are amalgamated for the purposes of this water balance model, as it is assumed that both waterbodies are used for concrete production water use.
- As suggested in the Groundwater Impact Assessment – Oxenford Quarry Extractive Boundary Realignment Project (G1913) (AGE 2018) and supported by *G1913A: Oxenford Quarry Response* (AGE 2019):

  "The inflow predictions show that the inflows are dominated by groundwater entering through the pit floor. The inflows predicted by the low bedrock conductivity scenario (total of 4 L/s or 130 ML/yr) are considered more likely to be representative of the magnitude of inflows to be observed during operations."

  Based off this statement, the groundwater inflow as anticipated at being 4 L/s (345.6 m^3/d) for the Quarry Pit Sump C3 for the ultimate site conditions.

  Further advice given in *G1913A: Oxenford Quarry Response* (AGE 2019), identifies that the groundwater inflow for the existing site conditions is 0 L/s.

- The two categories of 'water leaving the site' from the Quarry Pit Sump C3 have been classified as "Discharge Offsite" and "Pumped from Sump", classified below:
  - ***Discharge Offsite*** – This parameter is based on the water usage details as identified in Table 2-1. This is noted as approximately 90.7 ML/year. Water is discharged using this parameter only if there is enough water for the remainder of the onsite activities.
  - ***Pumped from Sump*** – this parameter is engaged when the volume of water in the sump is greater than the nominated maximum volume (see Table C-3). If this occurs, the water is pumped out at a rate of 6624 m^3/day (that is, approximately 80 L/sec for 24 hrs/day until max volume is once again received).

  Reduction in 'water leaving the site' is expected to be observed due to increased demand for increased concrete production. This reduction will be primarily observed in the "Pumped from Sump" parameter.

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BMT

Attachment A2 - 'Groundwater Impact Assessment' - showing best case and worst case scenarios

Groundwater Impact Assessment.pdf 48 / 154

The inflows from Zone 1, the pit walls, varies from 15.1 ML/yr to 72.4 ML/yr when the permeability of the bedrock is varied from 0.001 m/d to 0.01 m/d. The 0.001 m/d value represents the anticipated permeability of the rock at depth, due in large part to the closure of fractures from the overburden pressure. The 0.01 m/d value represents the permeability of the bedrock as measured in the monitoring bores completed for this project.

The inflows from Zone 2, the pit floor, varies from 113.6 ML/yr to 359.2 ML/yr when the permeability of the bedrock is varied from 0.0001 m/d to 0.001 m/d. The 0.0001 m/d value represents low permeability rock at depth, due in large part to the closure of fractures from the overburden pressure. The 0.001 m/d value represents the highest probable floor permeability.

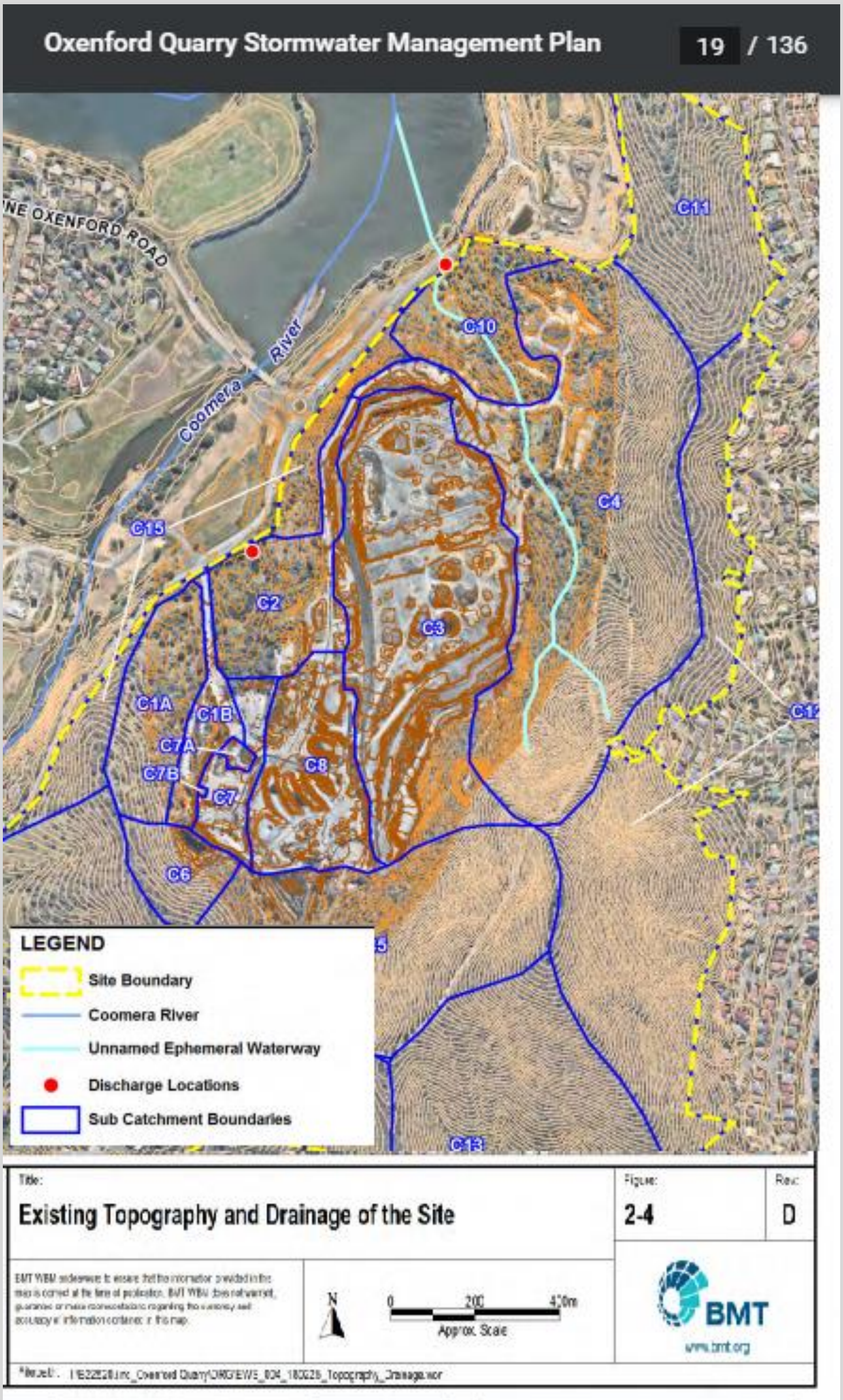
The inflow predictions show that the inflows are predominately from groundwater entering through the pit floor where the Neranleigh_Fernvale Beds are saturated. The inflows predicted by the low bedrock conductivity scenario (i.e. 4 L/s or 130 ML/yr) are considered more likely to be representative of the magnitude of inflows to be observed during operations.

Table 7.2 Analytical results

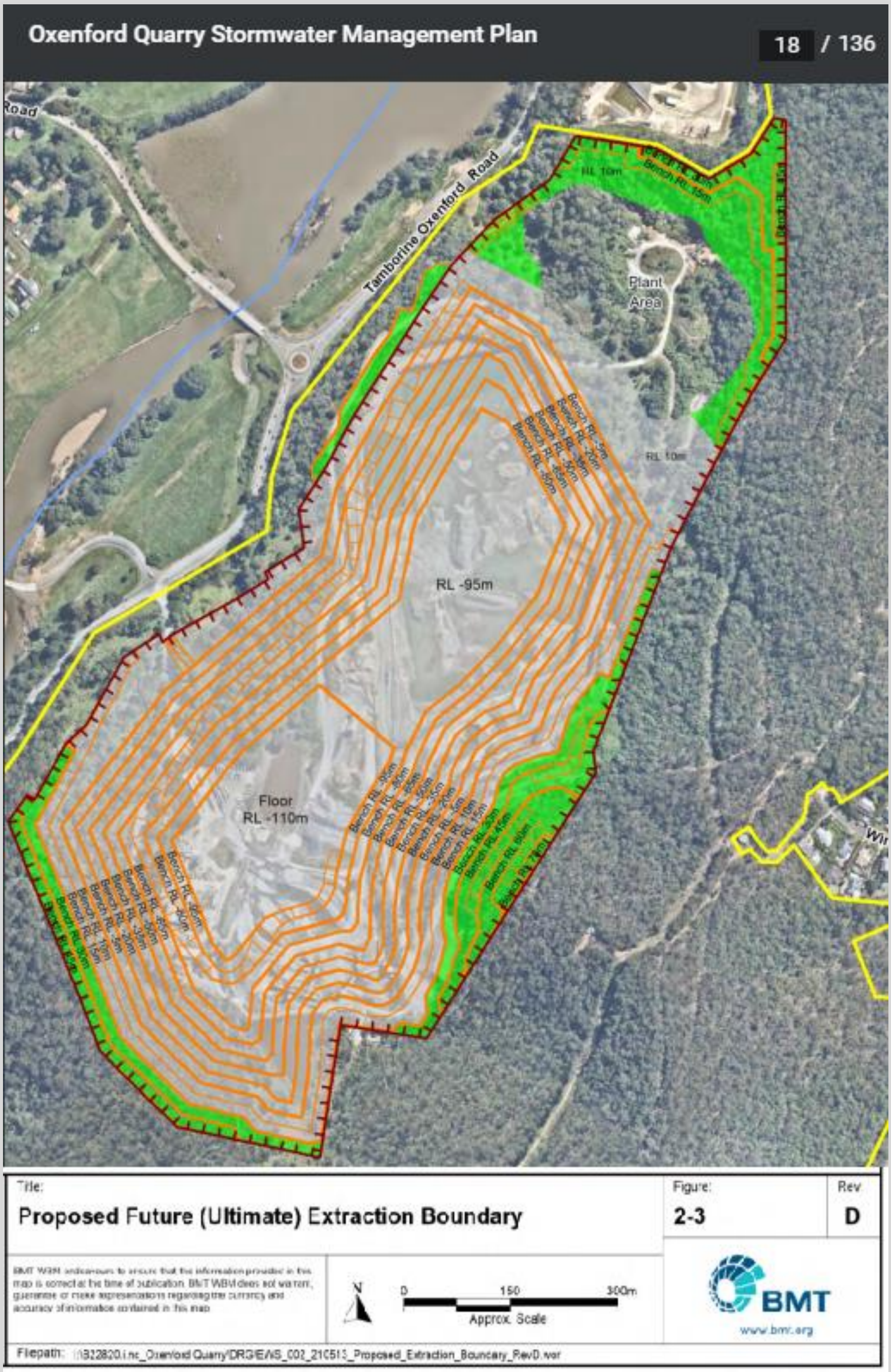
Scenario	Zone	K_{h1} (m/day) / K_{h2} (m/day)	Radius of influence (m)	Q (L/s)	Q (ML/yr)	Total (ML/yr)
Low bedrock conductivity	1	0.001	700	0.5	15.1	130 (best case)
	2	0.0001	700	3.6	113.6	
High bedrock conductivity	1	0.01	1,418	2.3	72.4	186
	2	0.0001	1,418	3.6	113.6	
High bedrock wall and floor conductivity	1	0.01	1,418	2.3	72.4	432 (worst case)
	2	0.001	1,418	11.4	359.2	

Attachment B1 - City Plan map: 'Environmental significance - wetland and waterways' overlay

Attachment B2 - Stormwater Management Plan, 'Existing Topography and Drainage of the Site'



Attachment B3 - Stormwater Management Plan: 'Proposed Future (Ultimate) Extraction Boundary'



Attachment B4 - Queensland wetlandinfo - Riparian Vegetation

wetlandinfo.des.qld.gov.au/wetlands/ecology/components/flora/riparian-vegetation.html

Queensland Government

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Wetland*Info*

Department of Environment and Science

Riparian vegetation

Vegetation is in an important component and driver of wetland systems. Through the process of photosynthesis plants convert energy from the sun into a form that provides the basis for aquatic and riparian food webs. The photosynthetic process also oxygenates the sediment and water column, which is particularly important in the aquatic environment and essential for the health of many other wetland creatures. Vegetation also influences the microclimate of the wetland as it can provide shading. Logs and other vegetative debris contribute to habitat complexity and influence water flow and channel formation. The baffling effects of vegetation (both living and dead) slow water and encourage deposition of sediment particles, influencing water quality and clarity.

Riparian and floodplain vegetation can slow flood waters

Photo by Cathy Ellis

Quick facts

Flash floods

are caused by drivers (e.g. high rainfall) and components (e.g. vegetation, soil, impervious surfaces) which interact to influence the processes (e.g. hydrological, fluvial and biological). This, in turn, determines the flood behaviour (e.g. flow paths, speed, volume, and height). The right catchment vegetation and riparian management can reduce the speed and volume of water entering the river system and the speed at which water drains from an area. This greatly reduce flood heights and speeds in downstream catchments.

Attachment C1 - Distribution of Inflows and Outflows - Figure C-8 Original Stormwater Management Plan DA

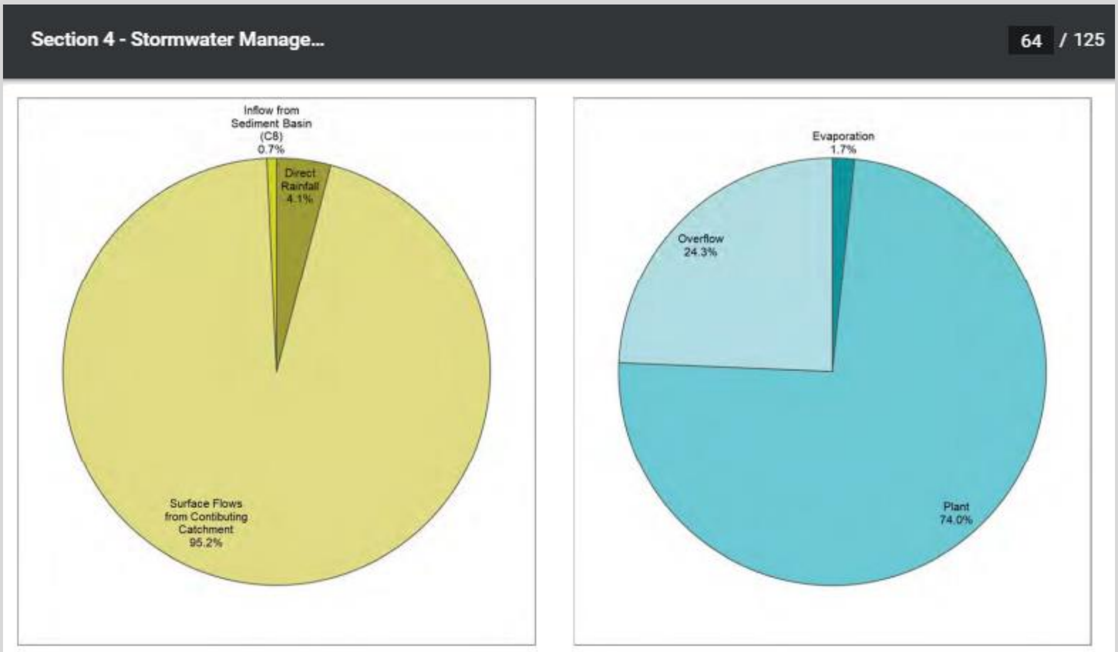

Figure C-8 Distribution of Inflows (left) and Outflows (right) for Dam 5 – Existing Site Conditions Low/Medium/High Concrete Production

Attachment C2 - Distribution of Inflows and Outflows - Figure C-8 Updated Stormwater Management Plan (dated 25th May 2021)

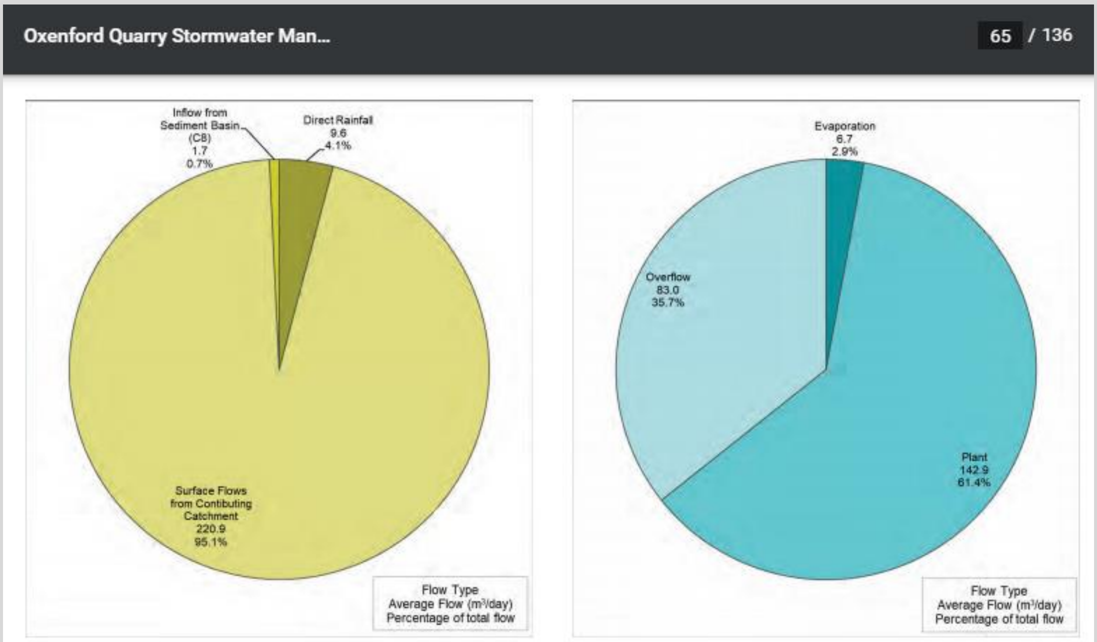

Figure C-8 Distribution of Inflows (left) and Outflows (right) for Dam 5 – Existing Site Conditions Low/Medium/High Concrete Production

Attachment C3 - Table C-4 origin of Figures e.g.C-8

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The figures are grouped via the explanation in Table C-4 below.

Table C-4 Figure groupings by scenario

Figures	Scenario
C-1 to C-18	Existing case with water pumped as per the assumptions identified in Table 2-1.
C-19 to C-36	Existing case with water sourced from the quarry sump when demand is not met from the specified waterbodies (see Table 2-1).
C-37 to C-48	Ultimate case with water pumped as per the assumptions identified in Table 2-1.
C-49 to C-66	Ultimate case with water sourced from the quarry sump when demand is not met from the specified waterbodies (see Table 2-1).

Table C-5 presents a summary of instances where the water demand from the site waterbodies satisfied water demands (or otherwise) over the modelling period for the existing site conditions.
Table C-6 presents a summary of instances where the water demand from the site waterbodies satisfied water demands (or otherwise) over the modelling period for the ultimate site conditions.
Tables C-7 to C-8 presents the average outflows from the site for all scenarios for the existing and ultimate conditions respectively.
Tables C-9 to C-10 presents the average flow distributions onsite (i.e. discharge, onsite water use, evaporation) for all scenarios for the existing and ultimate conditions respectively.

Attachment C4 - Table 2-1 Water Use details (original Stormwater Management Plan)

2019-10-28 sara Attach 7 Revised storm water plan.pdf 22 / 137

2.4 Site Water Demand

Depending on concrete production demand, the concrete batching plant requires variable volumes of water. For the purposes of this SMP, three scenarios for water use have been identified, namely low, medium and high concrete production use. Table 2-1 summarise the annual and daily water use on site, considering these different scenarios. As identified in Section 2.3, as the annual extraction volume is not proposed to be increased, this water use can be assumed for both the existing and ultimate site conditions.

Table 2-1 Water Use Details

Waterbody	Sediment Basin C8			Dam C5	Quarry Pit Sump		Concrete Batching Pit	Concrete Batching Pond	Water Reuse Pond	Ephemeral Wetland	Polishing Wetland
Waterbody volume (ML)	13.03			17.49	33.50		0.05	0.31	Unquantified	Unquantified	Unquantified
Primary Use	Water truck	Dust supper-ssion	Transfer to Dam C5	Plant use	Water truck	Discharged offsite	Concrete production		Occasional dust suppression	Not used	Not used
Low Concrete Production Use (ML/year)	4.91	20.02	23.4	91.00	24.87	90.69	5.28		Unknown (but small)		
Medium Concrete Production Use (ML/year)	4.91	20.02	23.4	91.00	24.87	90.69	14.70		Unknown (but small)		
High Concrete Production Use (ML/year)	4.91	20.02	23.4	91.00	24.87	90.69	27.99		Unknown (but small)		

Attachment C5 - Table 2-1 Water Use details (updated Stormwater Management Plan)

2.4 Site Water Demand

Depending on concrete production demand, the concrete batching plant requires variable volumes of water. For the purposes of this SMP, three scenarios for water use have been identified, namely low, medium and high concrete production use. Table 2-1 summarise the annual and daily water use on site, considering these different scenarios. As identified in Section 2.3, as the annual extraction volume is not proposed to be increased, this water use can be assumed for both the existing and ultimate site conditions.

Table 2-1 Water Use Details

Waterbody	Sediment Basin C8			Dam C5	Quarry Pit Sump		Concrete Batching Pit	Concrete Batching Pond	Water Reuse Pond	Ephemeral Wetland	Polishing Wetland
Waterbody volume (ML)	13.03			17.49	33.50		0.05	0.31	Unquantified	Unquantified	Unquantified
Primary Use	Water truck	Dust suppersion	Transfer to Dam C5	Plant use	Water truck	Discharged offsite	Concrete production		Occasional dust suppression	Not used	Not used
Low Concrete Production Use (ML/year)	4.91	20.02	23.4	91.00	24.87	90.69	5.28		Unknown (but small)		
Medium Concrete Production Use (ML/year)	4.91	20.02	23.4	91.00	24.87	90.69	14.70		Unknown (but small)		
High Concrete Production Use (ML/year)	4.91	20.02	23.4	91.00	24.87	90.69	27.99		Unknown (but small)		

Attachment D1 - Table C-8 Outflow from site - Ultimate Site Conditions (updated Stormwater Management Plan)

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Table C-8 Outflows from the site – Ultimate Site Conditions[4]

Scenario	Quarry Pit Sump C3 – Total outflow to polishing pond[5]		Sediment Basin C8 – Total outflow to polishing pond[5]		Total outflow	
	Average yearly flow (ML/yr)	Average daily flow (m^3/day)	Average yearly flow (ML/yr)	Average daily flow (m^3/day)	Average yearly flow (ML/yr)	Average daily flow (m^3/day)
Ultimate Site Conditions – No alternate waterbodies						
Low Concrete Production	923	2525	-	-	923	2525
Medium Concrete Production						
High Concrete Production						
Ultimate Site Conditions – Alternately sourced from Quarry Pit Sump						
Low Concrete Production	933	2554	-	-	933	2554
Medium Concrete Production	915	2506			915	2506
High Concrete Production	890	2437			890	2437

[4] This metric provides the average outflow, and is not representative of the frequency of water discharging from the site.
[5] Actual discharge to Coomera River will be reliant on the capacity within the respective polishing ponds at the time of receiving outflow waters from the quarry (i.e. Quarry Pit Sump C3 and Sediment Basin C8).

Attachment D2 - Table C-10 Flow distribution onsite - Ultimate Site Conditions (updated Stormwater Management Plan)

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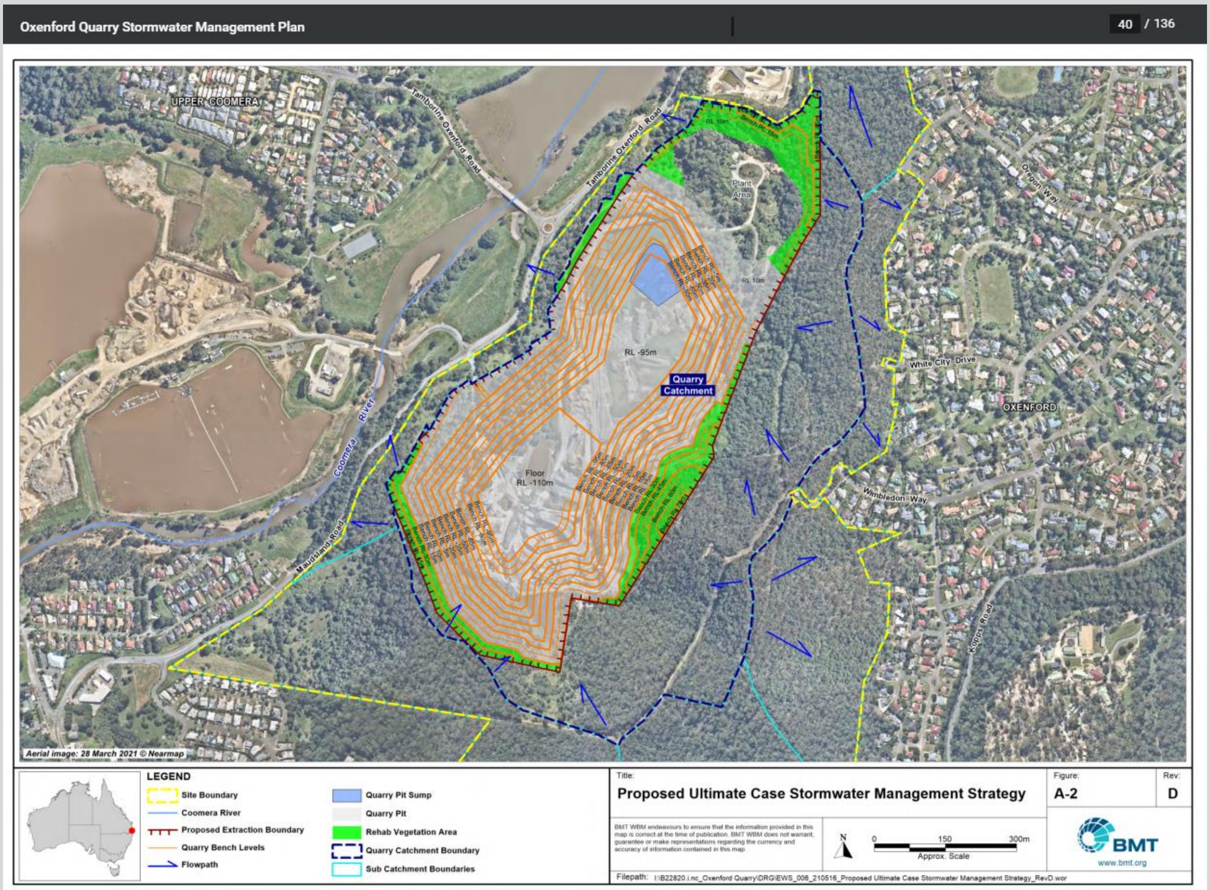
Table C-10 Flow distributions onsite – Ultimate Site Conditions[7]

Scenario	Concrete Production	Discharge		Use Onsite		Evaporation	
		Average yearly flow (ML/yr)	Average daily flow (m^3/day)	Average yearly flow (ML/yr)	Average daily flow (m^3/day)	Average yearly flow (ML/yr)	Average daily flow (m^3/day)
Ultimate Site Conditions – No alternate waterbodies							
Quarry Pit Sump C3	Low/ Medium/ High	923	2525	143	387	17	47
Concrete Batching Pit	Low	0.3	0.7	1.9	5.1	0.2	0.4
	Medium	0.2	0.5	2.0	5.5	0.2	0.5
	High	0.3	0.7	1.9	5.1	0.2	0.4
Ultimate Site Conditions – Alternately sourced from Quarry Pit Sump							
Quarry Pit Sump C3	Low	933	2554	141	386	11	29
	Medium	915	2506	141	386	11	29
	High	1690	4625	141	386	11	29
Concrete Batching Pit	Low	0.3	0.8	3.6	9.8	0.2	0.5
	Medium	0.2	0.6	8.4	23	0.3	0.7
	High	0.2	0.6	15.1	41.2	0.3	0.9

[7] This metric provides the average outflow, and is not representative of the frequency of water discharging from the site.

Attachment D3 - Figure A-2 - Proposed Ultimate Case Stormwater Management Strategy



Attachment E1 - Ultimate Site Conditions - Fig 3 - Recommended Stormwater Management practices

Ultimate Site Conditions - Nucrush Oxenford Quarry
Daily Stormwater Management Plan Operating Protocol

Figure 3: Schematic Diagram of Recommended Stormwater Management Practices