Ref: 23533

30th September 2019

Attention: Henry Bezuidenhout
Manager, Strategic and Sustainable Development
Moorabool Shire Council
PO Box 18
BALLAN VIC 3342

Dear Henry,

Re: PARWAN INDUSTRIAL PRECINCT
APPLICATION FOR APPROVAL OF A DEVELOPMENT PLAN
IWMP ADDENDUM

This letter is an addendum to the Alluvium Integrated Water Management Plan (IWMP) report dated April 2019, to provide further clarification in order to satisfy the Moorabool Shire Council's Request for Further Information (RFI) dated 15th July 2019, as well as Melbourne Water's RFI dated 26th July 2019, and Western Water's RFI dated 3rd July 2019.

1. INTRODUCTION

The original Integrated Water Management Plan (IWMP) for Parwan Industrial Precinct was prepared by Alluvium in April 2019 and is the subject of the above Moorabool Shire Council, Melbourne Water (MW) and Western Water (WW) RFI requests. We reviewed the Alluvium IWMP report and the relevant RFI comments. Based on detailed analysis and discussions with the above authorities, we propose an alternative integrated stormwater management strategy outlined below to service the Parwan Industrial Precinct and support the proposed Development Plan to the satisfaction of the referral authorities.

The following sections provide the details of the hydrological and WSUD assessment of the subject site and external catchments, and future strategy recommendations.

2. BACKGROUND HYDROLOGY AND CATCHMENT ASSESSMENTS

To support improved catchment delineation and creation of existing and proposed RORB models of the site and external catchments, the existing stormwater catchments were delineated using 54km^2 of the latest 2017/2018 Lidar data. Parwan Water catchment plans which include GPS pickups of existing culverts under Geelong-Bacchus Marsh Road and Nerowie Road were also used to support the catchment analysis. The revised overall catchment plans showing the revised external catchments are shown in Annexure 1 as listed below:

- ***Annexure 1A*** – (OCD1) – Existing Overall Catchment Plan - Lidar Contours
- ***Annexure 1B*** – (OCD2) - Existing Overall Catchment Plan – Lidar Thermal Elevation Map
- ***Annexure 1C*** – (OCD3) – Overall Catchment Plan showing Ultimate Site Development

p (03) 8660 3000
ACN 079 642 818 ABN 17 251 075 871
www.reedsconsulting.com.au
survey@reedsconsulting.com.au
engineering@reedsconsulting.com.au
planning@reedsconsulting.com.au
Lvl 6, 440 Elizabeth Street
Melbourne Victoria 3000
GPO Box 2240
Melbourne Victoria 3001

The internal site plans showing the existing, ultimate and interim conditions are shown in Annexure 2, as listed below:

- ***Annexure 2A*** - (CD1) – Internal Site - Existing Plan
- ***Annexure 2B*** - (CD2) – Internal Site - Ultimate Plan
- ***Annexure 2C*** - (CD3) – Internal Site – Stage 1A Interim Plan
- ***Annexure 2D*** - (CD4) – Internal Site – Stage 1B Interim Plan
- ***Annexure 2E*** - (CD5) – Internal Site – Stage 1C Interim Plan

New RORB models were created to determine the existing and ultimate 1% AEP (100yr ARI), 10% AEP (9.49yr ARI) and 63.2% AEP (1yr ARI) design flows for the subject site and external catchments. Updated RORB modelling was done based on the latest ARR 2019 parameters and standards. The design flows were derived using the Ensemble Method and based on ARR Datahub modelling parameters and temporal patterns, with necessary adjustments made to accord with the latest Melbourne Water RORB guidelines and modelling recommendations as discussed with Hugh Wallace, Stephen Miller and Laurence Newcome of Melbourne Water. Melbourne Water facilitated multiple discussions and reviews of our RORB modelling, and we would like to thank Melbourne Water for their assistance to date. Although the model has been reviewed and discussed extensively with Melbourne Water it is subject to further refinements and updates as part of further concept and functional design.

The RORB catchment details are shown in Annexure 3, as listed below:

- ***Annexure 3A*** – (RORB1) - RORB Catchment Plan – Overall Existing Catchment
- ***Annexure 3B*** – (RORB2) - RORB Catchment Plan – Existing Site Plan
- ***Annexure 3C*** – (RORB3) - RORB Catchment Plan - Existing Environmental Flows Model
- ***Annexure 3D*** – (RORB4) - RORB Catchment Plan - Ultimate Site Plan

During the initial catchment analysis and review of existing contours, five significant existing depressions were identified in the existing catchment as well as the existing Bingham Swamp, as shown in Annexures 1A and 1B. These existing depressions were included in the RORB modelling to evaluate their effect on the existing catchment hydrology. RORB models were created to estimate critical design flows for the 1% AEP, 10% AEP and 63.2% AEP storm events (refer annexures 3A, 3B and 3D) in order to ensure the proposed Development Plan layout can safely convey the external and internal design flows up to and including the 1% AEP design storm. To estimate design flood flows, the existing depressions were assumed to be 75% full prior to the start of design storm event, which is a very conservative assumption, but was deemed a sensible approach to ensure the waterway reserve widths proposed in the development plan will be adequate to convey extreme storm events. Environmental flow RORB model (Annexure 3C) assumes existing depressions are 10% full of water as would seem sensible in more frequent and lower intensity storms. Additional sensitivity analysis will be performed during detailed design to confirm the effect of existing depressions on catchment flows, but the approach above provides robust and conservative external design flow estimates to support the revised development plan layout.

3. EXTERNAL CATCHMENT FLOW ESTIMATES AND CONVEYANCE REQUIREMENTS

RORB external flow estimates are shown in Table 1 below and in Annexures 2B and 3A.

Table 1: Existing external catchment flows

AEP Event	Estimated existing RORB flows (m^3/s)	
	External Flow (South)	External Flow (West)
1% (100yr ARI)	10.2	28.1*
10% (10yr ARI)	5.3	13.8
63.2% (1yr ARI)	2.6	3.9

** It has been agreed with MW that a more conservative 35 m^3/s allowance will be used for western 1% AEP external catchment flow as part of the development plan*

The southern external catchment 1% AEP flow is estimated at 10.2m^3/s. A waterway drainage reserve approximately 50 meters wide is proposed to convey these external flows from the existing low point of Nerowie Road around the existing Bingham Swamp to the northern property boundary. The proposed drainage reserve will be used to convey the existing southern external flows as well as developed internal flows around Bingham Swamp into the ultimate retarding basin and wetland for stormwater detention and treatment. Conveyance capacity of the proposed waterway reserve was calculated using PC-Convey assuming a conservative 1 in 800 grade of the waterway. The maximum capacity of the proposed waterway channel flowing full is approximately 29m^3/s, hence the proposed waterway reserve can easily cater for the southern external flows and internal developed flows. PC-Convey results are shown in Annexure 4A.

The western catchment 1% AEP flow is estimated at 28.1m^3/s, however based on discussions with Melbourne Water it was decided to adopt a more conservative approach and allow 35m^3/s as the upper design external flow estimate. A waterway drainage reserve approximately 100 meters wide is proposed to maintain the existing hydraulic connectivity between the conservation reserve in the north west corner of the site and Bingham Swamp conservation reserve. The proposed waterway reserve will have adequate capacity to convey the existing western external flows and provide flood protection to the developed portion of the site in a 1% AEP flood event. Conveyance capacity of the proposed western waterway reserve was checked using PC-Convey assuming a conservative 1 in 800 grade of the waterway. The maximum capacity of the proposed waterway channel flowing full is approximately 73m^3/s, hence the proposed waterway reserve can easily cater for the existing external flows from the western catchment. PC-Convey section results are shown in Annexure 4B.

Lot freeboard requirements will be set as part of the future Council and Melbourne Water permit conditions and all lots adjacent to the proposed waterway reserves will be filled to comply with these.

In RORB modelling, existing depressions were assumed to be 75% full prior to storm event, which is a very conservative assumption. Geotechnical investigation and additional sensitivity analysis will be undertaken as part of detailed design to better understand the existing depressions storage and model them more accurately in RORB.

4. INTERNAL SITE MAJOR FLOW MANAGEMENT

Table 2 below shows the existing and ultimate 1% AEP external and internal site flows. Developed internal site flows will be conveyed around Bingham Swamp via the approximately 50m waterway reserve as shown in Annexure 2B to ensure no adverse impacts on the existing hydrological regime of Bingham Swamp. The proposed waterway reserve is wide enough to make provision for a low flow environmental pipeline to direct southern undeveloped catchment flows into Bingham Swamp if this is deemed necessary during detailed design pending Nature Advisory review of Bingham Swamp environmental flow requirements. A 1% AEP capacity retarding basin is proposed in the property immediately north of subject site, which is also owned by the Client, to ensure no increase in peak stormwater flows at Parwan South Road under ultimate development scenario. The proposed retarding basin currently modelled in RORB reduces existing flows at Parwan South Road and will be subject to further design development and refinement as part of detailed design in consultation with Melbourne Water, Moorabool Shire Council and Western Water.

Table 2: Existing and Developed Internal Site 1% AEP flows

Location	Existing 1% AEP flows (m^3/s)	Developed 1% AEP flows (m^3/s)
Southern External Catchment	10.2	10.2
Western External Catchment	28.2*	28.2*
Retarding Basin Inflow (Subject Site and Southern External Catchment)	12.3	17.2
Retarding Basin Outflow	N/A	12.1
Total Outflow at Parwan South Road (Retarding Basin Outflows and Western External Catchment)	37.9	36.6
Inflow to Western Water Site	38.9	37.9

** It has been agreed with MW that a more conservative 35 m^3/s allowance will be used for western 1% AEP external catchment flow as part of the development plan*

5. CRITICAL INTERNAL GAP FLOWS ANALYSIS AND FLOODWAY SAFETY REVIEW

Internal site drainage will be designed to 10% AEP capacity in accordance with Council requirements. Ultimate 10% and 1% AEP RORB internal site flows were analysed to estimate the critical internal gap flows at locations A and B shown in figure 1 below. Design gap flow estimates are shown in table 3 below. The critical gap flow is estimated at 2.7m^3/s at location A and can be safely conveyed via the proposed internal industrial road reserves. Annexure 4C shows three typical industrial road reserve cross sections modelled in PC-Convey allowing for 1 in 500 sawtooth grading and approximately 33m industrial road reserve widths. The maximum gap flow capacity in the proposed industrial road reserve is up to 8m^3/s in compliance with Melbourne Water floodway safety criteria. Detailed minor drainage analysis will be undertaken as part of internal road and drainage design, including detailed HecRas backflow analysis of proposed sawtooth roads. In the unlikely event of any localised issues with gap flow conveyance the minor drainage will be upsized to ensure gap flows meet relevant floodway safety criteria as specified in the Melbourne Water Land Development Manual and/or Infrastructure Design Manual to Council requirements. Lots adjacent to road reserves will be filled to ensure freeboard requirements as specified in the relevant planning permit conditions.

*Table **3**: Critical Gap flow analysis*

Location	Estimated internal 1% AEP (m^3/s)	Estimated internal 10% AEP (m^3/s)	Estimated design gap flow (m^3/s)	Maximum estimated gap flow capacity of industrial road reserve (1 in 500 sawtooth grade) allowing for standard MW floodway safety criteria
Critical Gap Flow Location A	6.0	3.3	2.7	8.0
Critical Gap Flow Location B	4.7	2.6	2.1	8.0

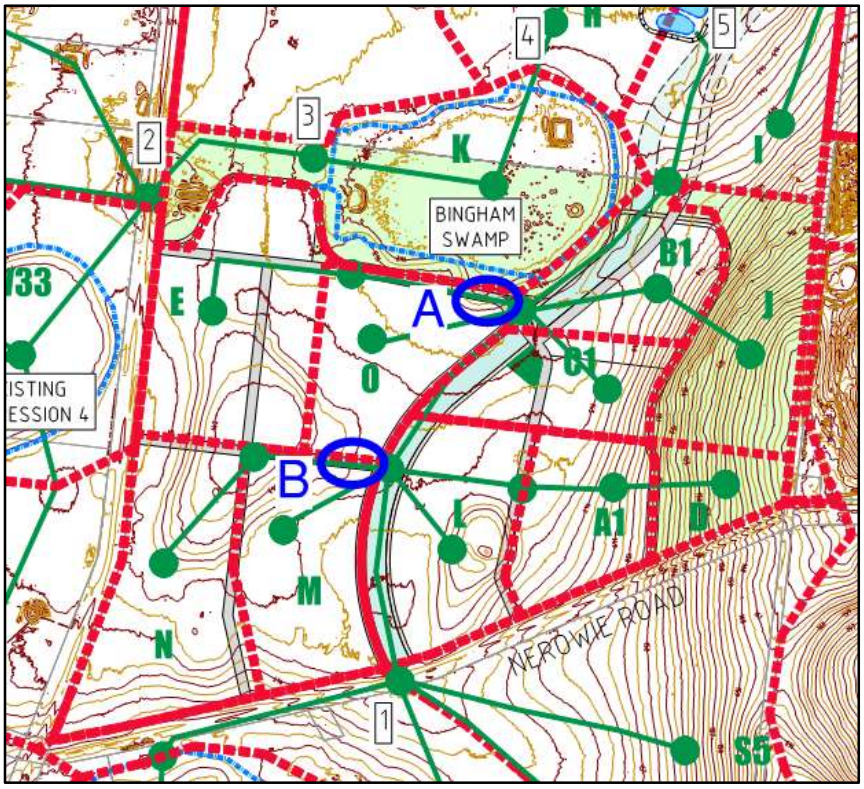


Figure 1: Critical Gap flow locations

6. TOPOGRAPHY AND FILLING REQUIREMENTS

Southern and eastern portions of the site are well graded and will not require significant filling. Northern and western portions of the site are low lying, and areas located outside of the Bingham Swamp conservation reserve will likely require filling.

Filling requirements will be governed by (a) levels of the proposed north/south waterway drainage reserve catering for southern external flows and internal site flows, (b) levels of the west/east drainage reserve catering for the western external flows, (c) minimum freeboard requirements and (d) minimum internal road gradings.

Annexure 2B Ultimate Site layout shows the indicative preliminary site grading and finished surface levels which will be optimised during detailed design to reduce filling requirements. Preliminary site grading analysis indicates the site will require approximately 1 to 1.5 meters of fill, with additional localised filling required in the existing depressions in the middle of the site. Internal roads are likely to be graded at 1 in 500 sawtooth grading to minimise fill requirements, and all lots be filled to comply with planning permit freeboard requirements.

The proposed development plan layout will be unaffected by the final alignment of the ultimate waterway outfall downstream of the site, because the existing surface levels along the northern property (range from 141.5 to 145 m AHD) are significantly higher than the existing low point in Parwan South Road (140.5) downstream of the site. Internal fill requirements will be confirmed during detailed design and the proposed development plan layout is conducive to various outfall channel alignment options.

7. DEVELOPMENT STAGING AND INTERIM OUTFALL REQUIREMENTS

Stages 1A (Protein Recovery Facility), 1B (Cold Storage) and 1C (Abattoir) will be developed in sequence as shown on interim site layout plan in Annexures 2C, 2D and 2E.

Stage 1A Protein Recovery Facility will be constructed first and will utilise the existing depression 2 in the middle of the site as an interim detention basin. An interim outfall channel will be constructed from the interim site outfall into the temporary detention basin as shown in Annexure 2C. An interim outfall channel will also be constructed to ensure discharge from the existing temporary detention basin will bypass interim development flows around Bingham Swamp. The temporary outfall channel will be constructed within the future waterway reserve and will daylight upstream of Parwan South Road. Details refer Annexure 2C.

Stages 1B and 1C will require a staged free-drainage outfall channel solution downstream of the subject site to the satisfaction of Melbourne Water and Western Water. The design development of these internal stages is expected to take one to two years during which time additional outfall channel option analysis, design, landowner negotiations and stakeholder consultations will take place in conjunction with Council, Melbourne Water and Western Water to ensure the ultimate waterway outfall is designed to satisfaction of the referral authorities.

Stage 1B Cold Storage is located in the north portion of the site and will trigger the staged construction of the ultimate waterway reserve, retarding basin and the ultimate outfall channel downstream of Parwan South Road. An indicative alignment of the ultimate outfall channel downstream of Parwan South Road is shown in Annexure 1C and is subject to further discussions and negotiations with Western Water and Melbourne Water. Interim outfall details refer Annexure 2D.

Stage 1C Cold Storage is located between stages 1A and 1B, and will necessitate an enlarged interim detention basin to ensure no increase in existing flows as a result of the development. Interim outfall details refer Annexure 2E.

The balance of site to the west will be developed in staged manner to suit the overall development timing. Ultimate site layout is shown in Annexure 2B.

8. ULTIMATE DRAINAGE OUTFALL REQUIREMENTS

The ultimate drainage outfall requirements were reviewed by Reeds Consulting in consultation with Melbourne Water. Existing RORB flows estimates of the overall catchment at Parwan South Road are shown in Table 4 below. These estimates are conservative as they assume the large existing depressions in and upstream of our site are 75% full of water prior to a storm event.

Catchment flow behaviour downstream of Bingham Swamp is complex as confirmed by Melbourne Water's internal Tuflow modelling of the area based on a nominal flow of 5m^3/s undertaken by Hugh Wallace. Melbourne Water's preliminary TUFLOW modelling suggest existing catchment outflows along the northern boundary of the site will split and discharge in a (a) northerly direction as shallow sheet flows over the existing transmission gas main via the northern properties and (b) north easterly direction via a defined valley line into Western Water site. The relative northern and north eastern flow proportions will vary depending on total flows however our preliminary RORB modelling does not account for this complex flow behaviour and instead estimates the total catchment flows at Parwan South Road.

*Table **4**: Catchment flow estimates at Parwan South Road / Western Water site*

AEP Event	Estimated existing RORB flows (m^3/s)	
	Existing total flows at Parwan South Road m^3/s	Developed total flows at Parwan South Road m^3/s
1% (100yr ARI)	37.9	36.6
10% (10yr ARI)	17.8	17.3
63.2% (1yr ARI)	3.9	4.2

Western Water expressed significant concerns regarding the ultimate outfall channel alignment in their RFI comments to ensure no adverse impacts on their Parwan Recycled Water Plant (RWT) in the ultimate site (and wider catchment) development scenario, including review of options to divert stormwater away from Parwan RWT.

Western Water's RFI comments do not acknowledge that their site is located in an existing low point of the catchment, and Melbourne Water's Tuflow modelling based on nominal flows confirms existing stormwater flows will enter their site under existing catchment conditions. Any ultimate outfall channel will have to cross the existing transmission gas main located approximately 960 meters north east of the subject site. Existing transmission gas mains are typically laid at a consistent depth with approximately 1m cover, so service clearance requirements over the existing transmission gas will more than likely be the critical design constraint when designing the invert levels of the ultimate outfall channel.

Review of latest Lidar existing surface levels over the existing transmission gas main alignment confirms a major low point east of Parwan South Road, inside Western Water's Parwan Recycled Water Plant as

shown in Annexures 1C and 2B. The existing surface level in the low point is approximately 139.5m AHD compared to 141-142m AHD levels in the adjacent gas transmission reserve. Based on our review of the catchment, this existing low point is a strategic location for the ultimate waterway crossing of the existing transmission gas main.

Our preliminary ultimate outfall proposal crosses the existing transmission gas main reserve in the existing low point in Western Water site. Protection of Western Water RWT assets is critical and is proposed to be done via (details refer Annexure 1C and 2B):

- Ultimate retarding basin to service the subject site and ensure no increase in existing peak flows as shown in Annexure 2B
- Ultimate outfall channel inside RWT site parallel to Parwan South Road, allowing for a flood protection bund inside RWT to protect the site from 1% AEP flows
- Ultimate outfall channel between RWT site and the ultimate point of outfall to Trib of Parwan Creek at Geelong-Bacchus March Road
- Further review of existing floodplain hydraulics west of Parwan South Road to confirm (a) minimum sizing of the ultimate waterway outfall/low flow channel through RWT site and (b) sizing of potential high flow, shallow sheet overland flow diversion in adjacent properties to the north to potentially allow high flow diversion around RWT site, subject to additional Tuflow analysis and stakeholder consultation

The indicative details of the ultimate outfall and proposed levee bank in RWT site are shown in Annexure 1C.

Placing the ultimate waterway strategically in the existing low point over the transmission gas main will allow efficient development of subject site and neighbouring low lying properties. The ultimate waterway reserve will be designed with minimum 1 in 800 waterway longitudinal grades and optimised during detailed design to minimise filling requirements. Preliminary site grading is shown in Annexure 2B.

The ultimate channel will be constructed to service the ultimate site as shown in Annexure 2B. Staged interim construction of the ultimate waterway outfall and retarding basin will be done as part of Stages 1B and 1C as outlined in section 7 above. The indicative interim arrangements are shown in Annexures 2C, 2D and 2E.

The interim detention basin storage requirements for stages 1A, 1B and 1C will be confirmed during functional design. The basins location is also subject to detailed design and site constraints and is located next to the ultimate waterway upstream of Parwan South Road

9. ULTIMATE STORAGE AND TREATMENT REQUIREMENTS

The post-developed RORB model includes the ultimate retarding basin to ensure no increase in existing site outflows as shown in Table 2. The retarding basin outfall will be optimised as part of detailed design in consultation with Council, Melbourne Water and Western Water.

Preliminary retarding basin 1% AEP detention requirement is approximately 79,100 m^3. Preliminary 1% AEP flood level is 141.7m AHD inside the ultimate retarding basin.

The development plan provides for best-practice stormwater quality treatment via ‘at source’ methods. Stormwater quality modelling was conducted using MUSIC model for the proposed site and wetland and three sediment basins were sized in accordance with preliminary discussions with Melbourne Water.

Preliminary MUSIC modelling indicates a requirement for a 37,200 m^2 wetland and three sediment ponds to Melbourne Water satisfaction. Internal lot rainwater tanks weren't included in this preliminary MUSIC model in order to provide a conservative estimate of the ultimate wetland requirements. Lot scale stormwater harvesting is highly encouraged and will be investigated further during detailed design.

The results of the MUSIC model are shown in Table 5 below:

*Table **5**: MUSIC model results*

	Sources	Residential Load	% Reduction
Total Suspended Solids (kg/yr)	87100	8760	89.9
Total Phosphorus (kg/yr)	141	39.3	72
Total Nitrogen (kg/yr)	1050	574	45.1
Gross Pollutants (kg/yr)	19500	0	100

The above results are subject to further modelling and inclusion of lot scale rainwater tank stormwater harvesting initiatives.

Two sediment ponds are proposed next to the waterway as shown in Annexure 2B to capture pollutants from developed site prior to discharging to the ultimate waterway channel in line with Melbourne Water best-practice requirements. The third sediment pond is located upstream of the ultimate wetland to allow sediment capture from the southern external catchment. Based on the review of ultimate catchment areas the three separate sediment ponds, the wetland and retarding basin will each service catchment areas greater than 60 hectares and are likely to fall under Melbourne Water drainage responsibility subject to further maintenance agreement discussions between Melbourne Water and Moorabool Shire Council. The ultimate size and layout of sediment ponds, wetland and retarding basin will be confirmed during functional and detailed design to satisfaction of Council and Melbourne Water.

Preliminary details of the retarding basin and wetland are shown in Annexure 2B.

10. BINGHAM SWAMP ENVIRONMENTAL FLOWS

Preliminary environmental flow analysis has been undertaken in RORB to estimate existing low flows into Bingham Swamp for a 63.2% AEP (1yr ARI) design storm event, as shown in Annexure 3C. This analysis assumes the existing depressions will be 10% full of water prior to the design storm event. Additional geotechnical analysis and continuous timestep hydrologic modelling will be done in MUSIC as part of detailed to improve the understanding of existing western and southern environmental inflows info Bingham Swamp.

This additional analysis will be used to size any potential southern external catchment low-flow environmental flow diversion pipe which will be incorporated into the proposed ultimate waterway reserve servicing the southern external catchment.

The above analysis is dependent upon further geotechnical investigations and hydrological modelling to confirm the impact of the depressions and the resultant environmental flows.

We also note that the updated Ecological Assessment by Nature Advisory will provide further clarity on the requirements to maintain the existing environmental flows and hydrologic regime to protect the

Bingham Swamp. Updated Music modelling will be done during detailed design to validate the environmental flows.

Buffer requirements will also be confirmed by Nature Advisory since based on discussions with Melbourne Water, the Healthy Waterways Strategy provide vague advice on minimum buffer requirements for large swamps.

11. STORMWATER HARVESTING AND RE-USE

Alluvium IWMP identified potential stormwater reuse harvesting from the ultimate retarding basin and detention basin including sourcing stormwater to supplement Bingham Swamp environmental water demands, as well as pivot irrigation of open paddocks. These reuse options will require significant stormwater reuse infrastructure and will be further assessed as part of detailed design. As a minimum lot-scale rainwater tanks and stormwater harvesting initiates will be further investigated during detailed design and to supplement potable and recycled water use on site. These initiatives will potentially offset the ultimate wetland sizing requirements. The proposed wetland modelled in MUSIC does not allow for site stormwater treatment initiatives and as such provides a conservative treatment area requirement to achieve best practice stormwater pollutant targets, as outlined in section 9 of this addendum.

12. CONCLUSION AND FURTHER RECOMMENDATIONS

This IWMP addendum outlines the interim and ultimate strategies to convey external and internal catchment flows via proposed waterway drainage reserves, manage increases in developed peak stormwater outflows via a revised reading basin proposal and treat stormwater runoff to best practice in accordance with Council, Melbourne Water and Western Water requirements. It is recommended that this IWMP addendum be endorsed to support the Parwan Industrial Precinct Development Plan.

Additional detailed hydraulic, hydrologic and stormwater quality assessments will be required as part of future planning permit conditions and will be informed by further geotechnical investigations and hydrologic and hydraulic modelling. Listed below are recommended follow up actions to facilitate further investigations, detailed design and negotiations with Council, Melbourne Water and Western Water:

Recommended future steps - Ultimate Outfall Channel alignment:

1A) Tuflow analysis of existing 1% AEP floodplain to be undertaken based on RORB modelling to confirm:

i) existing 1% AEP floodplain levels and preliminary site fill requirements to achieve freeboard
ii) proportion of existing catchment flows discharging to (a) northern properties as shallow sheet flow and (b) Western Water's RWT site as defined and concentrated inflows via Parwan South Road

1B) Design review of existing transmission gas main depths to confirm minimum service clearance requirements and the level and location of the ultimate outfall channel crossing over the transmission gas main

1C) Ultimate drainage outfall option analysis and discussions to be undertaken by Melbourne Water, Western Water and Council based on outcomes of 1A and 1B above to confirm the ultimate drainage outfall alignment downstream of subject site

REF: 23533E
PARWAN INDUSTRIAL PRECINCT
IWMP ADDENDUM

Recommended future steps - Bingham Swamp requirements:

2A) Additional geotechnical analysis and continuous MUSIC modelling to confirm the existing environmental flow regime to Bingham Swamp to advise sizing of potential external southern catchment environmental flow pipeline, subject to Nature Advisory recommendations regarding environmental flows and swamp buffer requirements

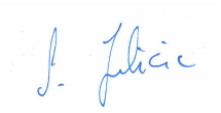
Recommended future steps - Internal Site design optimisation

3A) Interim and ultimate site design levels to be optimised during detailed design to minimise filling requirements in accordance with outcomes of items 1 and 2 above.

Should have any queries or require any further explanation or information concerning the above matter please contact the undersigned.

Yours faithfully,

For REEDS CONSULTING PTY LTD



SASHA JELICIC

SENIOR WATER RESOURCES ENGINEER