19th August, 2016

Panels Victoria
1 Spring Street,
Melbourne, Victoria 3000
MELBOURNE 3000

To the Panel

Melbourne Water –Melbourne Metro Rail Projects Environmental Effects Statement (MMRP - EES)

Thank you for the opportunity to review and consider the Melbourne Metro Rail Projects Effects Statement (EES) in its Exhibition period. Given our organisation’s participation within the EES’ Technical Reference Group, Melbourne Water has had considerable input and overview over this process while interacting with Agency representatives of the stakeholder forum.

We deemed it unnecessary to make format submission to the Hearings Panel which signifies we have had no major objection or call for re-direction of the project.

We are satisfied the EES correctly and adequately characterises Melbourne Water’s planning, business, and physical services management roles and is sensitive to our inter-Agency and community accountabilities in service delivery.

We therefore write to confirm to the extent of our planning jurisdiction and agency water services operations, Melbourne Water offer broad and in-principle support to the propositions and undertakings represented in the EES.

As criterion to this support we append a paper where we state our position on issues we understand are important in the delivery of the MMRP through the PPP mechanism. Also appended is correspondence relevant to conditions.

We take this opportunity to committing to assist the Planning Panel should our role be called upon.

Please contact our MMRP Liaison Manager, Mark Coffey on 0437 587 508 or Mark.Coffey@melbournewater.com.au if you require direct assistance.

Yours sincerely,

Michael Gomez
GENERAL MANAGER (Acting)

Attachment: Melbourne Water response to Exhibition Period of Environmental Effects Statement
Melbourne Metro Rail Project –
Melbourne Water response to Exhibition Period Of
Environmental Effects Statement
August 2016
Table of contents

General 1
Purpose 1
Floodplain Planning and Referrals 2
Floodplain Planning – Lower Yarra region 2
Consideration of ‘super exceedance’ flood behaviour and risk to MMRP 3
Floodplain storage loss at Western Portal – unresolved case 4
CBD South Station, City drainage and Elizabeth Street Main Drain 7
Yarra River crossing 9
Domain Station and interchange area 10
Eastern Portal area 11
Major Sewer Network 12
Major Water Supply Network 15
Ground-water discharge and Waste Disposal 16
Water Sensitive Urban Design, Ecology and River Health 17
Purpose
This document serves as Melbourne Waters (MW’s) comment across its interfaces with the Melbourne Metro Rail Project (MMRP – or the ‘Project’) with respect the Projects Environmental Effects Statement (EES).

The scope of comment is in the context of MW roles relating to:
- Floodplain Planning and Referrals
- Sewer transfer and operations
- Potable water transfer and operations
- Waste water discharge and treatment
- Water Quality and River Health

The order of comment commences at an over-arching or ‘system-wide’ considerations followed by specific sites from the West to East of the MMRP reference alignment.

Comment is offered with regard to Local Government interfaces, particularly Floodplain and drainage, to recognise integrated planning dialogue and the inter-dependencies of agencies within this aspect of land planning.

The comment “Positive Guidance Recommendations” are to convey items of note for the subsequent delivery entity of MMRP through its Private Public Partnership (PPP) mode.
Floodplain Planning and Referrals

The following are points of dialogue and observations relating the MW role as the Floodplain planning authority for Port Phillip Western Port.

In this context Melbourne Waters role is as the regional Catchment Management Authority, to:
- Prepare and implement regional floodplain strategies in line with national and state strategies
- Develop flood data and information
- Undertake flood risk assessments and risk-reduction studies
- Prioritise and implement regional risk-reduction projects in consultation with stakeholders
- Support emergency response planning and provision of warning services in line with national and state standards and frameworks
- Advise and support planning authorities on planning for flood prone land
- Manage urban development through statutory referral functions
- Support coastal adaptation planning
- Contribute to flood emergency response and clean-up where regional water assets are affected
- Own and maintain regional drainage infrastructure. (In the Port Phillip and Westernport region this generally refers to drainage systems servicing a catchment of greater than 60ha)
- Manage drainage function and environmental health of waterways and floodplains
- Help conserve and protect cultural heritage values of waterways and floodplains.

Floodplain Planning – Lower Yarra region

MW confirm the exchange of current floodplain data relevant to the MMRP scope for the Lower Maribyrnong River, Moonee Ponds Creek and Lower Yarra systems as the basis of understanding flood behaviours and relationships to the Projects features.

To understand and account for the flooding behaviour under the influence of Climate Change, MW confirm that MMRP adopted the CSIRO convention in calibration models in anticipation of Sea Rise of 0.8m and increase of rainfall intensity of 32% by Year 2100. (32% is considered ‘conservative’, resulting in a protective margin.)

MW confirms that the MMRP Surface Water Impact Assessment Report manifestly and properly describes the relationship of flooding to the MMRP and there is no ultimate adverse detriment to the Floodplain given the Projects scope and undertaking to adhere to requirements further mentioned.
Consideration of 'super exceedance' flood behaviour and risk to MMRP

MW offers observations in relation to the assessment of the vulnerability of MMRP to flood events greater than a 1% Average Exceedance Probability. (EAP) (Also known as the one-in-one hundred year flood event.)

Whilst such EAP are beyond the MW planning jurisdictional role, MW took technical interest in this discussion including acknowledgement of the currency and interpretation of flood modelling used in this analysis.

MW were observers at discussions between the MMRP Reference Design Joint Venture (AJMJV) and state rail officials.

The observational points were:
- Flood plain extents in super exceedance events were characterised conservatively and appeared technically correct
- There is flooding vulnerability of both MMRP portal structures in super exceedance events
- An existing portal to the Melbourne Underground Loop in Jolimont Yards also has vulnerability implicating MMRP in 'cross network connection' flooding
- There are no broader floodplain system mitigation means available to provide flood systems immunity for the portal or station structures. Options such as permanent localised levee bank protection are not considered viable as the subsequent flood storage loss is consequential to others
- Flooding of the MMR tunnels and structures would be catastrophic to infrastructure and lead to an extensive period of outage
- Risk to life due to tunnel flooding was seen as possible pending how effectively a shut-down and evacuation could be conducted.

There was resolution that flood-event actuated 'plugging' at portal entrances would be advisable to achieve absolute flooding immunity.

The practicality, serviceability and deploy-ability of various mechanical plugs was discussed including full or partial-closure gates, doors or inflatable 'plug*' devices.

(* Sometime referred to as "pigs").

Options for constructing emergency earth bunds or sand-bags wall were not considered operationally practical.

Positive Guidance Recommendation
By MW’s observation, it was resolved that stakeholders should understand the merit of a serviceable and safe system of super-exceedance flood protection.

**Floodplain storage loss at Western Portal – unresolved case**

Associated with the construction of the rail embankment for the Western Portal, MW are aware of loss of floodplain storage on the higher (critical storage) side of the rail to the North, or around JJ Holland Park area generally. (Approx. 7000 cubic metres.)

As the area is within a flood planning Special Building Overlay, it is an obligation of the MMRP proponent to provide analysis of the consequence of loss of storage to flood extent, duration and flow velocity. If there is an adverse impact, the project is required to mitigate the impact which is by convention done through removing (cutting) the equivalent volume of storage loss in the adjacent floodplain (or “cut and fill” balance in short.)

MW notes that MMRP apparently cannot offer land adjacent within the Rail Reserve where the cut volume can be achieved.

An alternative process, but not recommended, is to seek Planning Amendment approval for the consequent greater extent of the floodplain.

Analysis explaining the impact of floodplain storage losses impact has yet to be completed by MMRP.

Assuming that the cut compensation requirement stands as explained, MW urges MMRP to engage with land controllers to secure a viable site.

MW is aware of various public lands areas where the cut could be achieved. The possibility of creating other co-beneficial uses for such a site (foreseeably; wetlands, habitat, boat harbour, sports-ground or water storage for re-use) should be investigated.

**Positive Guidance Recommendations**

1. Complete analysis of consequence of floodplain losses on known final volume
2. Establish dialogue with landholders for cut balance candidate sites
3. Test effect by modelling
4. Implement storage compensation works by agreement with and recompense to the land owner/controller.
MMR Arden Station and Arden Macaulay Precinct Floodplain planning

MW confirms significant dialogue occurred in the preparation of the MMRP EES. In summary the evaluation of floodplain impact and mitigation measures proceeded to test two iterations:

1. Impact, mitigation and flood defence scenarios concerning the creation of the MMR Arden Station
2. An evaluative test of the floodplain scenarios concerning the future Arden Macaulay Precinct development

In both cases, modelling data conforming to MW’s known hydraulic conditions were adopted and further scenario modelling occurred. Importantly, these data reinforce the significant historic flood extent of the Moonee Ponds Creek, the influence of its catchment and incoming surrounding sub-catchments and vulnerability due to impending Climate Change factors.

Arden Station

In summary, solely in relation to the creation of the Arden Station, the dialogue expressed finally in the EES report demonstrates compliance with MW’s minimum flood protection and no adverse effect requirements.

To compensate for floodplain storage losses caused in the creation of Arden Station, MMRP confirmed that sufficient land within the projects control (Arden Government Land) is available for achieving a compensatory ‘cut’.

No reliance on upstream catchment, or ‘*offsite’ mitigation were assumed within the modelling as would have afforded a ‘favourable’ flood protection status for Arden Station and MMRP works. In other words, the pre-existing ‘worst undeveloped case’ flood condition was taken as a conservative assumption of flood levels.

(*Offsite options being catchment based retarding storage, deepening and widening of Moonee Ponds Creek or the creation or extension of flood protection levee banks.)

MW confirms a decision of MMRP for the setting of Arden Station design levels based on conservative flood protection and freeboard.

MW provided two letters of non-objection were provided to MMRP with relevant conditions. (Attached)

This stage of investigation being iterative with the broader community development drivers in the area, floodplain planning proceeded as outlined under.
Arden Macaulay Precinct development
MW confirms its overviewing of floodplain planning in the broader context of development, namely the Arden Macaulay Precinct and a conceptual Re-development Drainage Services Scheme as a sub component of a Moonee Ponds Creek catchment floodplain planning process.

Planning of the Precinct within this period being the designated role of the Metro Planning Authority (MPA), AJMJV further adapted flood modelling in concert with proposed street designs as issued by the MPA.

As decision support for the Precincts development business planning, the flood modelling sponsored by MMRP concluded that development in the surrounding precinct was viable citing a number of development related floodplain and waterway interventions are to be implemented.

MW confirms that flood models generated by MMRP were adopted by MW and MPA jointly for further detailed working in the context of precinct development planning.

Positive Guidance Recommendations
1. MMRP proponents are to be diligent in the management of floodplain functions particularly in the creation of compensating storage in the creation of Arden Station.
2. MMRP proponents on matters of MMR scope and impact, are to continue to refer to and be informed by MW on technical scope affecting floodplain function and MPA's progression of the Arden Redevelopment Drainage Scheme. This is particularly important concerning any revision of flood event levels affecting the protection of Arden Station.
CBD South Station, City drainage and Elizabeth Street Main Drain

MW confirms joint consultation with the City of Melbourne in relation to drainage associated with the CBD South Station area. Whilst the drainage system in this area is the responsibility of City of Melbourne, the overall CBD catchment context relates to the MW operated Elizabeth Street Main Drain and associated historic flooding system.

The drainage agencies jointly informed MMRP of a future projected floodplain strategy in planning of the CBD and formulated performance criteria for AJMJV to apply in the incorporation of drainage pipe conveyances for Flinders and Swanston Street as may be influenced by the underground station works. Chief among these criteria was the requirement to have drainage convey at a continuous grade of fall. No ‘syphon’ types of drains would be acceptable.

Among other criteria the City of Melbourne stated its requirement for a drainage conveyance standard of the 10% AEP a ‘non-mitigated’ flow in keeping with conservative assumptions. (The current actual is known to be markedly less than a 5% AEP.) Currently, water in excess of pipe capacity flows into and is conveyed in the street road reserve sometimes flowing into properties.

It is understood that designs developed by AJMJV means the MMRP works are capable of conveying this future ‘worst case’ flow, although flood behaviour may not substantially improve until upgrading of council drains or catchment mitigation measures are implemented. Whilst it was considered by AJMJV, there were no practically viable flood mitigation storage options which could be created as part of the MMRP design.

The City of Melbourne and MW were uncertain as to the status of condition of older brick drainage pipes under Flinders Street Station. The condition of these may have bearing on modelled flood extent and foreseeably improve clearing flood flows if repaired, cleared, upgraded or duplicated.

Consideration was given to establishing new drainage connections from Flinders/Swanson Street directly to the Yarra River to relieve flows travelling to Elizabeth Street. It is understood that there no was no available space allowing this.

MW understands there are no alterations proposed to the existing surfaces further affecting surface water movement in this area.

MW confirms it knows of no new adverse detrimental effect to the Elizabeth Street Drain flooding zone due to the MMRP.
Positive Guidance Recommendations

1. MMRP will need to make provision for the conveyance of all piped and surface drainage during construction of CBD Station so as not to create a flood risk.
2. The condition of drains under Flinders Street should be assessed to determine any need for repair or upgrading.
Yarra River crossing

MW notes the decision for tunnel boring of the MMR at depth under the Yarra River. This decision is particularly endorsed by MW in comparison to mooted "submerged tunnel" options. Such an option foreseeably would have included temporary partial blocking of the waterway during construction which would have caused the significant risk of regional flooding and other environmental impacts.

Any proposal for ‘proof grouting’ of the MMR tunnels under the Yarra River requiring drilling of the river bed will require consultation with MW as the nominated asset operator.
Domain Station and interchange area

The MMRP consultation with MW at Domain Station related to drainage outfall options to the Hannah Street Main Drain system which also connects partly to Albert Park Lake and the Yarra River via Kings Way.

MW confirms it reviewing iterations in the design options for of local drainage conveyances from St Kilda Road at the Domain Station envelope.

MW confirms that MMRP have acknowledged these sensitivity issues to local drainage:
- The Domain Station poses potentially as blockage to surface water distribution along St Kilda Road
- Diversion drains are required to collect drainage and prevent pooling of water in St Kilda Road which are to be directed to the existing MW connections at the Hannah Street Main Drain
- Upgrading or duplication of local drainage in Albert Road is anticipated
- MMRP proposed mitigation storage pipes built in to Albert Road. These were required to compensate for local ‘routing’ of drainage to Hannah Street Main Drain (of the section connecting the Yarra River)
- Whilst MW have a preference for connections from Domain area to be made directly to Albert Park Lake, a connection to Hannah Street Main drain is consistent with the current configuration therefore would have no greater detriment to Hannah Streets historic flooding zones.

Positive Guidance Recommendations

1. MMRP will need to make provision for the conveyance of all piped and surface drainage during construction so as not to create an additional flood risk in St Kilda Road.
2. Albert Park is the preferred receiver of surface drainage to increase productivity of the lake as a local storm-water re-use reservoir.
Eastern Portal area

The issue of protection of the Eastern Portal in relation to “super exceedance” flood events has been discussed prior in this paper.

Of significance in this location was dialogue involving the City of Stonington where MMR where examining any vulnerability of the existing rail cutting area to flood inflows from the local surrounds. The area of Chapel Street is one of historic flooding where Special Building Overlays (SBO) for flooding control development.

In summary, the resolution of floodplain behaviour was achieved through a number of investigation stages:

- Stonington notified MW and MMRP of their intentions to revise its local SBO condition consistent with a Local Planning Amendment processes
- MMRP and MW agreed that AJMJV's testing of the model could technically advise this amendment in concert with analysis being undertaken for MMRP
- Stonington City’s flood modelling program was adopted by AJMJV as a baseline of data
- Further data was added to the model updating it
- Flooding extents expressed confirmed generally that the rail cutting was not significantly engaged in overland flood flows.
- The flooding extents were adopted by Stonington as the true shape of the SBO and the updated modelling files were returned to both Stonington and MW for future reference purposes

MW has no further observations.
Major Sewer Network

MW is the owner and operator of metropolitan areas major sewer transfer and treatment system.

MMRP has two points of impact on the MW major sewer network:

North Yarra Main Sewer (NYMS) – (Crossing NYMS near Lloyd Street West Melbourne)

The NYMS general description is:

- Is a concrete cast-iron or wooden-shell encased circular pipe of 2.25m diameter (6ft 9inch)
- Built and operated since circa 1906, the NYMS is a critical sewer transfer pipe responsible for drainage of much of the communities of northern and north-west suburbs of Melbourne notably Essendon, Carlton, North Melbourne and Fitzroy.
- Being of this vintage, the NYMS is sensitive to changed conditions effecting external movement, vibration, ground pressure, ground-water quality and hydro-geophysical influences
- There are no significant options for the diversion or management of flows should the NYMS fail
- Failure of the NYMS would result in significant environmental and community consequence
- The NYMS current condition is good to fair. The timescale of considering renewal or replacement of the sewer is not due for 20 years. It is likely the sewer has a further serviceable life of 50 to 100 years plus

MMRP commissioned survey and asset condition assessment capturing accurate locational data. MW provided CCTV footage of the asset for condition referral purposes.

Based on the Interim Reference Design, MW understands the outer diameter of the MMR rail tunnels pass about 3.0m vertical separation under the NYMS.

Whilst this clearance is closer than our preference, in principle MW do not object conditional on the following typical requirements being met:

1. No aspect of the MMRP’s creation or operation can adversely affect the material integrity or the operation of the sewer
2. Vibration will be strictly monitored and restricted so as not to cause damage
3. Changes in ground conditions will not adversely affect the sewer
4. The operation of the MMR (including dynamic loading and vibration) will not adversely affect the sewer
5. MMRP will repair any damage caused which will be to the appropriate MW standard of work
6. The MMRP will report post-contract on the condition of the sewer.

Generally, MW have confidence that MMRP are aware of these issues and will hold their contractors to compliance in protecting the NYMS.

South Yarra Main Sewer

South Yarra Main Sewer (SYMS) – (Crossing NYMS at the proposed MMR Domain interchange station)

The SYMS general description is:
- Is a triple brick lined circular pipe of approx. 1.875M (6ft 3inch)
- Built and operated since the 1890’s, the SYMS is a critical sewer transfer pipe responsible for drainage of much of the communities of the inner eastern suburbs of Melbourne, notably South Yarra, Richmond, Malvern, Kooyong and Toorak
- Being of this vintage, the SYMS is sensitive to the influence of external movement, vibration, ground pressure, ground-water quality and hydro-geophysical influences
- There are no significant opportunities for the diversion or management of flows should the SYMS fail
- Failure of the SYMS would result in significant environmental and community consequence
- The SYMS current condition is good to fair. The timescale of considering renewal or replacement of the sewer is not due for 20 years. It is likely the sewer has a further serviceable life of 50 to 100 years plus

MMRP commissioned survey and asset condition assessment capturing accurate locational data. MW provided a number of technical resources relating to operation, CCTV footage of the asset for condition referral purposes.

Based on the Interim Reference Design, the SYMS is directly involved and impacted by the creation of the Domain Station so it is proposed that the sewer is relocated/diverted parallel and to the south of the existing alignment. MW understand the vertical separation of the sewer to the new Domain rail platform is about 300mm from outer pipe to the nearest overhead slab.
MW have been consulted and provided 'in principle' support to the relocation based on adherence to a number of critical criteria including:

1. The new sewer is to operate to no less than its exciting transfer service capacity both for fluid and gas movement. The pipe size will not be reduced in diameter and multiple pipes will not be accepted
2. The vertical grade of fall will be comparable to the current condition. No proposal for altering the existing grade of fall (such as by a syphon or pumping) will be accepted
3. In its relationship to the new MMR station, the sewer will be structurally independent and fully isolated from the effect of MMR
4. All material, asset-life, operational and safety standards required by MW will be adhered to
5. Any sewer pipe protection measures (such as pipe material strengths, shielding and vibration monitoring) anticipated as needed during the construction and of the MMRP and Domain Station and operation of the trains must be installed at the appropriate time to eliminate damage to the SYMS.
6. Continuity of retail service connections to the sewer (operated by South East Water) will be maintained and retail re-connections will be to the satisfaction of both MW and SEW
7. MW will be incorporated into the workforces concerned with the design, construction and final commissioning of the sewer as a form of project oversight and to incorporate sequential approvals/consents including the issuing of Permits
8. The existing redundant SYMS sewer will be properly decommissioned.

MW understands this relocation work forms part of the Early Works component of MMRP. MW has commenced to work with that party.

MW has been consulted comprehensively by MMRP in consideration of impact on the North Yarra Main Sewer.

Positive Guidance Recommendations
1. That all measures of risk management are implemented to avoid failure of the SYMS particularly. The PPP must ensure that construction parties following early works are accountable with regard to the continuing protection and operation of the sewer
2. MW are to be notified promptly of any change of scope affecting this component of work
Major Water Supply Network

MW is the owner and operator of metropolitan areas major water supply transfer system.

MMRP has two points of impact on the MW major water supply network:

Preston Footscray Main

The Preston Footscray Main is a critical water transfer pipe running under the existing surface rail system close to South Kensington Station. The pipe diameter is 1.150m constructed in 1958.

Whilst not directly affected by the MMR scope, it is involved in enabling works associated with the broader rail network upgrading and due to the relocation a High-voltage transmission tower power through Early Works.

MW understands that provisions for protecting the pipeline are in place and no adverse impacts are anticipated.

Positive Guidance Recommendations
1. MMRP will seek MW’s formal consent to construct near, and make provision to protect the pipeline from the risk of construction. Protective concrete covering is anticipated for new rail crossings
2. Checks and provision will be made as needed in relation to electrical 'stray current', cross-bracing of current and cathodic protection due to electrical works.

Punt Road Main

The Punt Road Main is a critical water transfer pipe running above the proposed MMR tunnel near Toorak Road and Walsh Street. A redundant section of the same Main runs on Punt road. Both occur at relatively shallow levels.

Given the vertical separation is approximately 18m, no adverse impact is anticipated.

Positive Guidance Recommendation
1. Checks and provision will be made as needed in relation to electrical 'stray current', cross-bracing of current and cathodic protection due to train traction electrical works
Ground-water discharge and Waste Disposal

MW acknowledges a considerable body of analysis of ground-water conditions and disposal scenarios commenced through the MMRP Reference Design and constructability planning process. This allowed the affected agencies to understand impacts of both the construction and future operation periods of MMRP.

In the context of disposal options (or Trade Waste treatment services) AJMJV and MMRA constructability advisors (Advisian) conducted combined consultation with the EPA (as regulatory controller), City West Water and South East Water (as Trade Waste service licensors) and Melbourne Water (as treatment service providers at the Western Treatment Plant - WTP).

With the constraints of local retail sewer pipe capacity and ultimate treatment capability at WTP being important determinants of the water service agencies, MMRP consultants worked through the Projects construction mitigation and phasing (work rate) scenarios until an acceptable daily rate of discharge was achieved, albeit conceptual and projected as a 'worst allowable case'.

A combined water agencies provided 'in principle' acceptance for the receiving of the waste was provided to MMRP stating limitations of volumes and composition levels. (Attached)

MW notes the undertaking of MMRP not to discharge Groundwater to waterways. Provided any proposed discharge is determined permissible within State Environmental Protection Policy, EPA or other relative legislative requirements, MW in-principle would not object to this as potential receivers of the discharge water.

Formal application should be made to MW or the relevant Local Government asset owner to detail any such proposal.

MW generally note the undertaking of MMRP to construct "tanked" structures would significantly reduce ongoing Groundwater ingress and call for discharge of groundwater.

Positive Guidance Recommendation

1. MMRP to note the sensitivities of Melbourne’s larger waste treatment network to the volume and composition of water
2. MMRP PPP will continue to consult all Agencies in relation to Groundwater discharge options consistent with the refining project scope (Defined in correspondence)
3. Opportunities available to further mitigate Ground water discharge rates and manage water quality ‘in-situ’ through the creation of MMRP should be taken.
Water Sensitive Urban Design, Ecology and River Health

MW have no specific points of comment regarding the breadth of subjects and EES chapters covering the Water Sensitive Urban Design, Ecology and River Health.

MW observe the comprehensive characterisation of values, status and environmental performance requirements.

With reference to stormwater management and water efficiency and MW observes the general approach to MMRP design consistent with Best Environmental Management Practice processes.

MW confirm it will continue to work collaboratively with State Government, water Agency, Local Government and other stakeholders to further refine Integrated Water Management complementary to MMR’s sustainability objectives. Options such as joint investment in local water re-use schemes are expected to be progressed.
For further enquiries and support in relation to the above advice contact:

Mark Coffey  
Liaison Manager  
Major Infrastructure Projects - Asset Management Services  
Melbourne Water Corporation  
(03) 9679 6737  
PO Box 4342 Melbourne VIC 3001

Attachments:  
1 Correspondence confirming referral responses on Floodplain Management – Arden and Macaulay – Arden Government Land  
2 Trade Waste 'in principle' treatment.
11 August 2015

Farah Bach
Precinct Manager
Melbourne Metro Rail Authority
Level 13, 121 Exhibition Street
Melbourne Victoria 3000

Dear Farah

Referral Response to: MMRP Arden Station location and construction case – Floodplain impact

Construction Phase:
We refer to the Melbourne Metro Rail Projects proposal for the creation of the Arden Station and associated construction work and the analysis of its floodplain impacts.

Melbourne Water has completed a review of the investigation documentation submitted. (Attached Memo 23/07/15 AGL Precinct (VicTrack) Construction and Station Only Compensatory Storage Assessment).

In principle, Melbourne Water does not object to the proposed activity as we are satisfied the works proposed could be done with no further adverse effect on floodplain and drainage functions. In particular we note a number of Arden Station locations are considered and the land available for attenuation storage is on Arden Government Land (AGL) parcels for which MMRP has functional control and responsibility.

Melbourne Water conditions for the works are:
- MMRP as proponent are satisfied that its works are adequately protected from flooding.
- Public safety must be considered in order to design storage areas. This item can be clarified further at the detail design stage.
- Overland flow is directed towards the proposed storage pond and the pond is ‘free draining’.
- Detailed plans and hydraulic modelling must be submitted to Melbourne Water prior to construction to demonstrate how the above conditions are achieved.

Future Development:
Melbourne Water understands that in due course further hydraulic modelling work will be undertaken by the Melbourne Metro Rail or another development authority considering the ultimate future development within the Arden Macaulay Structure Plan and AGL precinct to improve liveability. In order to develop the above precincts including rail station, the following conditions must be satisfied prior to commencement of development.
- Proposed development should be designed so as not to increase 100-year ARI flood levels of the Moonee Ponds Creek and Arden Street Drain.
- Finished floor level of building must be set at least 600mm above the 100-year flood levels.
• Safe access criteria need to be achieved in for the whole site in its developed state. Note that this should be considered when siting the railway station so that overland flows can be provided for.

• The preliminary hydrology calculations indicated that a pump station with 5m³/s capacity will be required in conjunction with flood storage volume of flood of 111,000 m³ in an area adjacent to the Moonee Ponds Creek (within open space) and could include storage in streets to a shallow depth, with building lots set higher.

• Widening and Deeping of the Moonee Ponds Creek in conjunction with open space may increase flood storage and may lower 100-year flood levels below existing flood levels. A detailed landscaping and detailed hydrology and hydraulic modelling will be required of the Moonee Ponds Creek and Arden Street MD to demonstrate there is no significant impact on the 100-year ARI flood level of both drains.

• Preference would be for finished surface level of open spaces adjacent to the Moonee Ponds Creek not to be set lower than 10-year ARI flood level of the Moonee Ponds Creek. This would apply particularly to linear pedestrian paths. Consideration to lower finished levels would require some barrier to protect people walking into deeper water, such as bollards and chains.

• The catchment area located east of the railway yard drains flow onto AGL site located south of Arden Street. The 5-year ARI flow at Laurens Street is 1.6m³/s and adjacent to Moonee Ponds Creek is 2.6m³/s. An underground drain pipe may be required to convey 5-year ARI flow through railway yard and drain into proposed retarding basin. The 100-year ARI flow of this sub area is approximately 3.3m³/s, overland flow should be provided for in this area from east to west.

• Based on preliminary sea level rise (SLR) in Port Phillip it appears that there may be significant impact on current flood levels of the Moonee Ponds Creek and it may reduce capacity of Arden Street Drain due to downstream boundary condition at outlet of pipe. Therefore it would be worth taking into account sea rise level as well in any modelling scenario.

• Hydraulic modelling and detailed plans will be required to be submitted to Melbourne Water, to demonstrate how above conditions are achieved.

Should you require any clarification or further assistance please contact Mark.Coffey@melbournewater.com.au or by phone 9679 6737.

Yours sincerely

KEITH BONIFACE
TEAM LEADER – FLOODPLAIN INVESTIGATIONS
MELBOURNE WATER

c.c.

Emily Mottram – Metropolitan Planning Authority
Michael Norton - City Planning and Infrastructure – City of Melbourne
Aijaz Memon – Melbourne Water
3 June, 2016

Katie Watt  
Manager - Land, Planning and Environment  
Melbourne Metropolitan Rail Authority  
Level 13, 121 Exhibition Street, MELBOURNE, VICTORIA 3000

Dear Katie

Re: Consolidated response and decision to MMRP Groundwater discharge and future trade-waste discharge and treatment options

This correspondence issues a combined agency response to the proposed groundwater discharges associated with creation of the Melbourne Metro Rail Project (MMRP).

The Agencies in their respective roles are:

- City West Water (CWW) and South East Water (SEW) as the future ‘licensors’ for receiving trade waste.
- Melbourne Water (MW) as operators of the ultimate receiving waste treatment facilities at the Western Treatment Plant.

No opinion or authority is made by the above agencies with respect to Groundwater (GW) resource use or impacts as this role resides with Southern Rural Water (SRW). Any impacts to groundwater usage should be referred to SRW.

Melbourne Water or Local Government Drainage Authorities will require consultation about any proposal to discharge groundwater to a waterway or drainage system. Such a method of disposal will be subject to EPA requirements, State Environmental Planning Policy and/or other relevant Acts.

Process of consultation and when coming to this decision

1. Policy/legislative requirements within the formulation of the MMRP Environmental Effects Statement

2. Preliminary GW and hydrogeological data-sets and construction discharge scenarios created by MMRP in concert with ‘whole-of-project’ planning

3. PRELIMINARY GROUNDWATER INFLOW (Draft Report) ASSESSMENT MELBOURNE METRO RAIL AUTHORITY 8 February 2016

4. Draft model discharge model spreadsheet - "Groundwater quality data (Feb 2016)" with iterations informed by various project phasing, construction and mitigation measures

5. Joint agencies Ground Water Discharge Interagency Workshop held at Melbourne Water Thursday, 25 February 2016 9:30 AM-12:00 PM included EPA, CWW, SEW and MW
6. Groundwater quality data Additional parameters.xlsxm issued by MMRP featuring iterations informed by mitigation measures (base-case establishment)

7. Specific feedback and conditions from the Agencies as per the Attachments 1-2

8. Melbourne Waters consideration of the impacts to the Western Treatment Plant operation due to the loads and volumes proposed.

9. Agency responses and condition as consolidated per this letter and attachments from CWW, SEW and MW

**Decision**

Combined, the water services agencies have **no in-principle objection** to the receiving of ground water through a licenced waste treatment system subject to these understandings and limitations:

1. All feedback provided is on the basis of managing temporary groundwater discharge only and not to be construed as approval and/or acceptance of any ongoing (post-construction) discharge.
2. The comment is limited to the scenario put before the agencies.
3. Treatment facility demand changes dynamically and no guarantee is made by the agencies to accept wastes projected in this MMRP case. In practical terms, the MMRP projected GW discharge should be acknowledged as a probable 'upper limit' of peak discharge (TDS and Volume).
4. Beyond TDS and Volumes, upper limits are further defined at the Western Treatment Plant having sensitivity to 'impacting' parameters not limited to Sodium, Potassium, Calcium, Magnesium, Chloride, Phosphorus, Arsenic, Boron, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel and Selenium.
5. The MMRP constructing consortia will in due course engage the agencies in the communication and planning of GW discharge.
6. MMRP will apply to CWW and SEW as relevant to business service area for Trade Waste discharge licences to be created as per the conditions. (See attachments 1 and 2)

We thank MMRP in the preparation of extensive and detailed data allowing our agencies to assess this case.

Please contact myself in relation to Melbourne Water liaison matters or City West Water or South East Water directly via the contacts under should you need further assistance.

Yours sincerely

[Signature]

Liaison Manager
Major Infrastructure Projects
Melbourne Water

c.c.
German Ferrando-Miguel EPA
Guy Frodsham – South East Water
Amanda Smith – City West Water
Adrian Mazzarella – Melbourne Water
Hayley Trimble – Melbourne Water
Hi Mark

We have completed our desktop assessment. The results are below:

- Hydraulically no individual site would need referral to engineering for assessment (all peaks are less than 5L/sec).

- While all sites are likely to exceed the 200kg/day load limit for TDS only three will exceed the proposed interim sodium limit of 375kg/day. Our feeling is it's these 3 sites that we would require the waste management hierarchy be applied to – it all depends on what MW feels is the best management option as they’re responsible for both endpoints.

- From a Trade Waste management perspective we would create agreements on an as-needs basis as the need arises for discharge. The timeline suggests 3 year agreements would accommodate most individual sites.

- Based on our current approach we would require gross solids separation and a flowmeter to be installed at each discharge location.

Continued:
<table>
<thead>
<tr>
<th>Location</th>
<th>Peak Groundwater Inflow (L/s)</th>
<th>Peak flow x avg concentration (TDS kg/day)</th>
<th>Compliant with &lt;200kg/day TDS?</th>
<th>CWW origin assessment based on conc. data supplied</th>
<th>Na/TDS ratio</th>
<th>Approximate sodium load</th>
<th>Compliant with 375 kg/day sodium?</th>
<th>Exhaust hierarchy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Portal</td>
<td>0.5</td>
<td>539.2</td>
<td>No</td>
<td>Seawater</td>
<td>0.33</td>
<td>177.9</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Arden</td>
<td>2.1</td>
<td>1,881.1</td>
<td>No</td>
<td>Seawater</td>
<td>0.33</td>
<td>620.8</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Parkville</td>
<td>0.3</td>
<td>269.6</td>
<td>No</td>
<td>50/50 GW/seawater</td>
<td>0.29</td>
<td>78.2</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CBD North</td>
<td>1.7</td>
<td>1,103.4</td>
<td>No</td>
<td>Groundwater</td>
<td>0.25</td>
<td>275.9</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CBD South</td>
<td>1.6</td>
<td>910.8</td>
<td>No</td>
<td>Groundwater</td>
<td>0.25</td>
<td>227.7</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Cross Passage 2</td>
<td>0.9</td>
<td>3,437.0</td>
<td>No</td>
<td>Seawater</td>
<td>0.33</td>
<td>1,134.2</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Cross Passage 3</td>
<td>0.9</td>
<td>2,527.2</td>
<td>No</td>
<td>Seawater</td>
<td>0.33</td>
<td>834.0</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Happy to discuss.

Regards,

Amanda
ATTACHMENT 2. SOUTH EAST WATER

Mark

Please find below feedback as requested:

- Hydraulically we do not see any major concerns with inflows as all peaks are less than 2L/sec, however, no doubt the groundwater will be pumped and therefore inflow will not necessarily govern instantaneous discharge rates (L/sec & L/minute). All discharge rates will be subject to application and further investigation will also be required in order to identify suitable/acceptable discharge points. Sewerage works may be required in order to provide adequate discharge points. Temporary connections into South East Water manholes will not be permitted.

- Customer Specific Acceptance Criteria (C-SAC) will be required for TDS at all sites. South East Water models daily loads based on peak flow and max concentration when formulating C-SACs for temporary consents/agreements. Note - I have adopted Amanda (Smiths) Sodium method of assessment for information only as South East Water do not currently operate under an interim Sodium load limit. Sodium is only deemed to exceed the interim limit in the Domain 1T case, where peak flow and max concentration is applied. MW will be provided notification of the C-SACs for TDS and MW will need to assess the overall TDS/Sodium impact from the project and provide feedback to the retailers accordingly.

- Consents/Agreements will be set up for each location (application attached)

- Based on our current requirements, we would require an adequately sized settling tank and a flow meter to be installed at each discharge location.

<table>
<thead>
<tr>
<th>Location</th>
<th>Peak Groundwater Inflow (L/s)</th>
<th>Peak flow x Max concentration (TDS kg/day)</th>
<th>Peak flow x Max concentration (TDS kg/day)</th>
<th>Compliant with &lt;200kg/day TDS?</th>
<th>Origin assessment (assumption) based on conc. data supplied</th>
<th>Na/TDS ratio</th>
<th>Approximate sodium load based on Avg TDS load</th>
<th>Approximate sodium load based on Max TDS load</th>
<th>Compliant with 375 kg/day sodium?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain 1T</td>
<td>1.7</td>
<td>656</td>
<td>1515</td>
<td>No</td>
<td>Mix Groundwater: Seawater</td>
<td>0.29</td>
<td>190.24</td>
<td>439.35</td>
<td>No</td>
</tr>
<tr>
<td>Domain 2T</td>
<td>0.8</td>
<td>306</td>
<td>707</td>
<td>No</td>
<td></td>
<td>0.29</td>
<td>88.74</td>
<td>205.03</td>
<td>Yes</td>
</tr>
<tr>
<td>Eastern Portal</td>
<td>0.5</td>
<td>231</td>
<td>245</td>
<td>No</td>
<td>Groundwater</td>
<td>0.25</td>
<td>57.75</td>
<td>61.25</td>
<td>Yes</td>
</tr>
<tr>
<td>Intervention Shafts</td>
<td>Location. Cont.</td>
<td>Peak Groundwater Inflow (L/s)</td>
<td>Peak flow x Max concentration (TDS kg/day)</td>
<td>Peak flow x Max concentration (TDS kg/day)</td>
<td>Compliant with &lt;200kg/day TDS?</td>
<td>Origin assessment (assumption) based on conc. data supplied</td>
<td>Na/TDS ratio</td>
<td>Approximate sodium load based on Avg TDS load</td>
<td>Approximate sodium load based on Max TDS load</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------</td>
<td>------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>-----------------------------</td>
<td>---------------------------------</td>
<td>----------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Linlithgow Ave</td>
<td>0.7</td>
<td>277</td>
<td>507</td>
<td>No</td>
<td>Groundwater</td>
<td>0.29</td>
<td>80.33</td>
<td>147.03</td>
<td>Yes</td>
</tr>
<tr>
<td>Fawkner Park</td>
<td>0.5</td>
<td>214</td>
<td>302</td>
<td>No</td>
<td>Groundwater</td>
<td>0.29</td>
<td>62.06</td>
<td>87.58</td>
<td>Yes</td>
</tr>
</tbody>
</table>

In regards to South East Water point of contact, Todd Martin is our Major Project Coordinator and during the tendering stage, all conversations should be channelled via Todd:

**Todd Martin** - Land Development Major Project Coordinator  
WatersEdge 101 Wells Street, Frankston VIC 3199 southeastwater.com.au  
Telephone: +613 9552 3261 Facsimile: 9552 3501

All trade waste applications can be sent to trade.waste@sew.com.au

Once Tenders have been awarded, direct contact can be made with myself in regards to trade waste related items.

Regards

Guy

**Guy Frodsham** - Industrial Waste Coordinator  
WatersEdge 101 Wells Street, Frankston VIC 3199 southeastwater.com.au  
Telephone: +613 9552 3106 Facsimile: 9552 3673 Mobile: 0428 597 581

Go paperless and manage your account online at mysoutheastwater.com.au