

APA Technical Note - Western Outer Ring Main - Environment Effects Statement

TECHNICAL NOTE NUMBER: TN18

DATE: 22 September 2021

SUBJECT: Assessment of design updates and response to RFI# 3.

SUMMARY This Technical Note provides an assessment of the design and alignment changes which have occurred following the exhibition of the Western Outer Ring Main (WORM) Environment Effects Statement (EES). A description of the changes is found in TN08. This Technical Note also includes a direct response to RFI # 3 (included below).

REQUEST 3. Advise whether a decision has been made to install a 500 mm or 600 mm pipeline and explain any implications for the EES arising from the alternative pipeline diameters. (Sections 3 and 14).

RELATED INFORMATION:

- APA Technical Note No. 08 - Pipeline alignment & design changes - Response to RFI 3, 5 and 6 (including attached Amended Map Book Part 2 & 3)
- APA Technical Note No.09 - MLV 2 & 3 Design Changes
- ARCGIS Mapping Tool – layer Rev 7 to rev 10 construction footprint changes

NOTE:

Background

- 1 The EES prepared for the WORM Project assessed the design and construction of the Project as outlined in EES Chapter 4 Project Description and depicted in EES Attachment IV – Map Book, known as alignment version 7.
- 2 This Technical Note has been prepared to respond to design amendments which have been proposed following the exhibition of the EES and formally sought by way of Pipeline Licence Amendment Application under s36 of the *Pipelines Act 2005*. The revised alignment is known as version 10 in the Mapping Tool and Map Book. These changes are described in TN08.
- 3 In summary, the design changes include:
 - Realignment of the Deep Creek crossing – the pipeline crossing of Deep Creek is proposed to be moved south by approximately 100 metres. The construction method has not changed and will be bored.
 - Minor construction footprint changes – a number of changes to the construction footprint (additions and subtractions) as a result of discussions with landowners, to reduce environmental impact, and improve constructability.

- Change to the size of the pipeline - the EES assessed a 600 mm diameter pipeline, however APA has confirmed that the pipeline diameter can be reduced to 500 mm. The Inquiry RFI#3 sought confirmation of the diameter and an assessment of the impacts of any change to the diameter. The implications have been assessed by each specialist area and are set out in the Table below.
 - Confirmation of the construction methodology to be applied at the Beatty's Road (confirmed HDD near KP 2.2) and Parkland Crescent (confirmed open cut near KP27) crossings. As both options were assessed in the EES assessments, the confirmation of options do not affect the conclusions or proposed environmental management measures (EMMs) in the EES assessments.
 - Confirmation that the proposed 'access option' near KP 42 (shown on pages 43-46 of EES Attachment IV – Map book) is not required for construction access. This change does not affect the EES technical assessments as this is an existing access track constructed by Yarra Valley Water and no physical construction works were proposed by the Project.
- 4 The amendments to the pipeline alignment and construction corridor have also been formally submitted under Section 36 of the Pipelines Act 2005 to the Department of Environment, Land, Water and Planning (DELWP) Pipelines on 27 August 2021. TN08 explains the changes in more detail and includes a set of revised mapping showing the changes that have been assessed below by relevant technical areas.

Implications of alignment changes

- 5 The authors of the EES technical reports have reviewed the design amendments to determine implications to the findings and conclusions of the EES Technical Reports. The outcomes of this review are provided in Tables 1 and 2 below.

Table 1 Summary of the implications of design amendments to the findings of the EES Technical Reports

Aspect	Implication for EES Technical Report
Air quality	<p>As the EES Technical Report G <i>Air quality</i> undertook a risk-based impact assessment, the design amendments identified in the 'background' section above are not considered to affect or change the impact assessment, proposed environmental management measures (EMMs) or conclusions of the technical report. This is on the basis that:</p> <ul style="list-style-type: none"> • The re-alignment of the Deep Creek crossing has increased (or maintained) the distance of the crossing to sensitive receptors. The construction method to install the pipeline across Deep Creek has not changed (it will be a horizontal directional drill). As such, the management measures for launch / retrieve sites (EMM AQ1, AQ3) remain appropriate and will avoid and minimise the impacts of dust emissions during construction. • EMM AQ1 has an adjustment factor depending on the risk associated with distance between construction activity and sensitive receptors, as such the CEMP will be able to accommodate changes as required depending on distance from works to receptors (which would be confirmed prior to commencement of the works). • The change to the pipe characteristics (including the change to 500 mm diameter) is not expected to change the requirements of material transfer (such as digging and backfilling a trench) that generate construction dust.

Biodiversity	<p>The design amendments identified in the ‘background’ section above have been assessed separately in Technical Note 15 – Ecology update for design amendments.</p>
Contamination	<p>The design changes noted above do not change the conclusions documented in the EES Technical Report E <i>Contamination</i>.</p> <p>The re-alignment of the Deep Creek crossing and minor alignment changes have been reviewed and determined not to be associated with any areas identified as being potential sources of contamination, based on the historical and site information gathered as part of EES Technical Report E <i>Contamination</i>.</p> <p>Further, given the change to the size of the pipeline does not alter the area of consequence, which sits wholly within the 500 m buffer area assessed by the EES Technical Report E <i>Contamination</i>, there is no significant change of risk to the Project associated with these design revisions and therefore no change to the findings or conclusions in EES Technical Report E <i>Contamination</i>.</p> <p>Therefore, the design changes do not change the content or conclusions documented in EES Technical Report E <i>Contamination</i> and no changes are required to be made to the EMMs.</p>
Cultural Heritage	<p>The relocation of the Deep Creek crossing location and the alignment change does not change the findings or conclusions in the EES Technical Report I <i>Cultural heritage</i> for this location. As discussed in the EES Technical Report I <i>Cultural heritage</i>, land adjacent to creeks, tributaries or waterbodies have been shown to yield Aboriginal archaeological places such as stone artefact scatters and scarred trees, and are therefore considered to be archaeologically sensitive landforms. Water and waterways also form an important part of Aboriginal people’s culture, being used as both sources of creation stories and as traditional resources. During the preparation for CHMP 16593, subsurface testing targeted the land surrounding Deep Creek (as part of earlier revisions), including the surrounding escarpment landforms. Subsurface excavation as part of the Complex Assessment is currently ongoing and includes the areas within the revised alignment at the Deep Creek crossing. The excavation will define the extent, nature and significance of Aboriginal cultural heritage in this area, which will be managed in accordance with the conditions of CHMP 16593 (once approved).</p> <p>The minor design amendments identified in the ‘background’ section above have been reviewed in regards to EES Technical Report I <i>Cultural heritage</i> and it is noted that the majority of changes represent small additions or reductions to areas that have already been assessed under previous revisions. These small additions or reductions therefore do not change the implications or conclusions for the content of the EES Technical Report I <i>Cultural heritage</i>.</p> <p>The area added to the construction footprint at KP 1.052 (MPS825760) however reduces the distance of the Project Area from an Aboriginal place; . As a result, a component of the place is now located 5 metres east of the Project Area (the Project Area is closer than with the previous alignment). This does not change the implications or conclusions for the content of the EES Technical Report I <i>Cultural heritage</i>. The additional area has been surveyed (31 August 2021) and no area of archaeological potential was identified.</p>

Greenhouse Gas The design amendments identified in the ‘background’ section above affects the findings documented in EES Technical Report H *Greenhouse gas*.

The realignment of the Deep Creek crossing and the other minor alignment / construction footprint changes impact the area of vegetation impacted by the Project. As a result of all these alignment changes, the area of native vegetation impacted is increased by 1.49 hectares and the area of non-native vegetation impacted is reduced by 13.46 hectares. This leads to a net reduction of vegetation impacted by approximately 11.97 hectares, resulting in a reduction of Scope 1 emissions by 990 t CO₂-e. Total emissions from land use changes are now estimated to be 12,510 t CO₂-e (previously 13,500 t CO₂-e).

Changes to the size of the pipeline from a 600 mm diameter pipeline to a reduced 500 mm reduces the total quantity of steel required during construction and reduced embodied emissions from material consumption. As a result of these changes, Scope 3 emissions are reduced by 9,267 t CO₂-e. Total embodied emissions from material consumption for the construction phase of the Project is now estimated to be 21,663 t CO₂-e (previously 30,930 t CO₂-e).

The design changes noted above do not change the overall conclusions documented in the Technical Report H *Greenhouse gas* and there are no changes required to the documented EMMs. Additional information on Greenhouse Gas calculation methodology can be found in TN22 (in response to RFI #86 and 88).

Groundwater The design changes noted above do not change the conclusions documented in the EES Technical Report C *Groundwater*.

The construction method to install the pipeline across Deep Creek has not changed (will be bored) and dewatering of bell holes was not expected based on recorded groundwater levels.

The location of the pipeline is moving south by approximately 100 metres at Deep Creek, however it is not anticipated that any gross changes in groundwater level or quality would occur at this small distance, therefore the groundwater conditions and impacts anticipated (i.e. no bellhole dewatering) are the same as assessed in the EES.

For the other minor alignment changes, as per the Deep Creek location change, it is not anticipated that any gross changes in groundwater level or quality would occur at the changed locations, therefore the groundwater conditions and impacts anticipated are the same as assessed in the EES.

The change in design of the pipeline from 600 mm diameter to 500 mm diameter does not change any potential impact on the groundwater along the alignment, as the depth the pipeline will be buried at remains the same.

There are no changes required to the documented EMMs for groundwater as a result of the design changes.

Land Use The design amendments do not materially affect the findings or conclusions in EES Technical Report K *Land use* and EES Chapter 15 *Land Use*.

The land use impact at Deep Creek is within the same planning zone and land use typology as previously assessed in the EES. The other minor design amendments also affect land of the same planning zones as the previous design.

The decrease in diameter of the pipeline from 600 to 500 mm means the pipeline Measurement Length will be reduced from 659 metres to 526 metres (see Safety assessment in Table 2 below). The EES therefore assessed a wider area than is now necessary and is therefore conservative. The Area of Consequence does not change due to the change in diameter and remains at 65 metres. Therefore the EES assessment of impacts to future planning within this area is unchanged.

The design amendments have been considered against the findings and conclusions in EES Technical Report K *Land use* and EES Chapter 15 *Land Use* and it has been concluded that no changes are required within the report or chapter or the EMMs.

Landscape and visual

The design amendments do not affect the findings or conclusions in EES Technical Report J *Landscape and Visual*.

The change to the pipeline crossing of Deep Creek would appear at viewpoint location 08: Wildwood Road, with the alignment further away from the viewpoint location. The changed alignment would move from 10 meters to the north of the viewpoint to 90 meters to the south. However, as the construction methodology is still HDD, the visual impact would remain the same as identified within the current assessment.

The minor footprint changes and minor re-alignments would not change the current impacts assessed within the EES Technical Report J *Landscape and visual* or the proposed EMMs. The changes would occur within the same Landscape character areas identified and would not affect the remaining viewpoints locations (excluding viewpoint location 08: Wildwood Road as described above). Therefore, the minor footprint changes would not change the current assessment or findings.

A separate technical note has been prepared for design amendments that relate specifically to the locations of the mainline valves (refer Technical Note 09 – Mainline valve 2 and 3 design changes).

Land stability and ground movement

The design changes noted above do not change the conclusions documented in the EES Technical Report D *Land stability and ground movement*.

The realignment of the pipeline at the Deep Creek crossing (KP16.7) approximately 100 metres further south of that assessed for the EES Technical Report D *Land stability and ground movement*, places further distance between the pipeline and the Deep Creek site of geomorphological or geological significance (SGGS) (VRO Site Ko5) and therefore reduces any potential risk to that site.

The creek crossing is to be undertaken using trenchless methods and was anticipated in the EES Technical Report D *Land stability and ground movement*, to encounter weathered Silurian rock and alluvial soils. Figure 6.1 of Technical Report D *Land stability and ground movement* suggests that similar conditions will be encountered. To confirm this, the EMM GM6 – Confirmation of ground risk within the CEMP requires that additional geotechnical investigations are undertaken for sites where there is insufficient or no geotechnical information to confirm the viability of proposed temporary works (i.e. choice of trenchless method).

The minor alignment changes have also been reviewed and would not impact on any of the findings of the EES Technical Report D *Land stability and ground movement*, as it is expected that the ground conditions will be similar to that which has been previously assessed.

The previous EES assessment was based on a nominal pipeline diameter of 600 mm diameter, with an equivalent excavated diameter of 700 mm assumed to be required. The proposed reduction to 500 mm diameter is expected to result in a reduction in excavated diameter (now assumed 600 mm). This is a reduction in the cross sectional area of the pipeline of approximately 26%, which will result in reduced ground movements and hence reduced risk to nearby utilities and other structures.

Based on this assessment, the design amendments identified in the 'background' section above do not change the conclusions documented in the EES Technical Report D *Land stability and ground movement* and there are no changes required to the documented EMMs within.

Noise and Vibration

As the change in the location of the Deep Creek crossing will increase the separation distance to receptor C262, the noise impacts from boring is expected to be less than that predicted in EES Technical Report F *Noise and vibration*. As a result, this location may require less mitigation during boring, but will still be required to meet the noise EMMs during construction (EMM NV1, NV2, NV4, NV5, NV6, NV7, NV10).

The minor alignment changes have been reviewed to identify if they have resulted in a variation of separation distances to nearest noise sensitive receptors and relevant construction noise estimates. The relocation of the pipeline alignment south at KP17 increases the distance to receptor C262. This is anticipated to lead to lower predicted maximum construction levels for C262. Construction noise for day time operations was predicted to meet relevant criteria at this receptor. As per EMM NV1, a Construction Noise and Vibration Plan would be prepared and implemented to manage impacts on sensitive receptors, with consideration taken to reduce the impacts of noise and vibration to sensitive receptors as much as possible (NV4).

The change in a nominal pipeline diameter to 500 mm with similar work methods and equipment used for construction does not result in a change to the findings or conclusions in EES Technical Report F *Noise and vibration* assessment.

Safety

See Table 2 below

Surface Water

The design changes noted above do not change the conclusions documented in the EES Technical Report B *Surface Water*.

The realignment of the pipeline at the Deep Creek crossing (KP16.7) approximately 100 metres further south of that assessed for the EES Technical Report B *Surface Water*. The construction laydown area and entry pit for the trenchless construction has been relocated further south-west from the edge of Deep Creek with a greater offset that would minimise potential construction runoff and/or potential impacts to the waterway. The location of the crossing is directly upstream of the confluence of the tributary and Deep Creek, with the laydown area situated on a steep slope, however, as trenchless method is still proposed for this crossing, the realignment would not impact the findings of the EES Technical Report B *Surface Water*.

The minor re-alignments and minor footprint changes have also been reviewed and are not anticipated to change the water quality, water level or flow regimes at these locations. Therefore, the minor changes would not change the current impacts assessed within the EES Technical Report B *Surface Water* or the proposed EMMs.

The change in design of the pipeline from 600 mm diameter to 500 mm diameter does not change any potential impact on the surface water along the alignment, as the depth the pipeline will be buried at remains the same.

The design amendments have been considered against the findings and conclusions in EES Technical Report B *Surface Water* and it has been concluded that no changes are required within the report or the EMMs.

Table 2 Summary of the implications of design amendments to the findings of the Safety Technical Report

Comment on impact to EES Technical Report M Safety

Pipe diameter changed from DN600 to DN500

- The pipeline diameter change would only affect Section 3.4.1 of the EES Technical Report M *Safety*, Table 4 – Summary of pipeline parameters.
- As the Safety Management Study (SMS) (GPA, 2020) assessment was based on DN500, the results and conclusions of the EES Technical Report M *Safety* are still valid.
- These changes are not considered to impact the risk assessment undertaken in Section 8 of EES Technical Report M *Safety*.

Alignment has changed Revision 10 (from the exhibited version Revision 7)

- The alignment changes summarised in Technical Note 18 – Pipeline alignment changes do not impact the risk assessment. This is because the changes have not affected the location classifications. Location classes are based on current and reasonably foreseeable land uses within the measurement length of the pipeline. Because a large area is considered, the small alignment changes do not introduce additional threats or consequences. Each alignment change is internally assessed by APA from a safety perspective prior to accepting the change.

Changes to wall thickness

- Confirmed 10.31mm (standard wall) and 12.7mm (heavy wall).
- The standard wall thickness of 10.31mm is acceptable in T1 locations.
- These changes are not considered to impact the risk assessment undertaken in Section 8 of EES Technical Report M *Safety*.

Changes to location class (Rev 10)

- All the alignment changes occurred in an area that was entirely Rural location classification as defined in AS/NZS 2885 (R1) and didn't intersect any secondary location class areas.
- The location classes listed in Table 8 will be changed as per APA Technical Note.28 (TN28), these have been summarised below

Location Class	Approximate Total length (km)	% of Total Pipeline
R1	16.2	31.8
R2	3.8	7.5
R2/CIC	0.7	1.3
T1	17.3	34.0
T1/CIC	5.4	10.6
T1/S	5.8	11.4
T1/S/C	0.7	1.4
T1/S/CIC	1.1	2.1
Total	51.009	100

- The change of alignment results in a change to the KP values for each section.

	<ul style="list-style-type: none"> • These changes are not considered to impact the risk assessment undertaken in Section 8 of EES Technical Report M <i>Safety</i>.
Area of Consequence (AoC) for 500 mm vs 600 mm	<ul style="list-style-type: none"> • APA has confirmed that the Area of Consequence for the 500 mm pipeline remains at 65 metres. The Area of Consequence is a function of credible threats and pipeline pressure and is independent of diameter. • These changes are not considered to impact the risk assessment undertaken in Section 8 of EES Technical Report M <i>Safety</i>.
Measurement Length	<ul style="list-style-type: none"> • The measurement length was recorded as 659 metres for the previous design, however it has now changed as a result of the change to the diameter of the pipeline to 500 mm, to a measurement length of 526 metres. The previous revision therefore provided a more conservative basis for the location classifications. • These changes are not considered to impact the risk assessment undertaken in Section 8 of EES Technical Report M <i>Safety</i>.