

**UNDER** the Resource Management Act 1991

**IN THE MATTER OF** the proposed direct referral of an application for resource consents for activities associated with Te Ahu a Turanga: Manawatū Tararua Highway Project

**BETWEEN** **WAKA KOTAHI NZ TRANSPORT AGENCY**  
Applicant

**AND** **MANAWATŪ-WHANGANUI REGIONAL COUNCIL**  
Regulatory Authority

**AND** **DIRECTOR-GENERAL OF CONSERVATION**  
**QUEEN ELIZABETH THE SECOND NATIONAL TRUST**  
**ROYAL FOREST & BIRD PROTECTION SOCIETY INCORPORATED**  
**MERIDIAN ENERGY LIMITED**  
**TRANSPower NEW ZEALAND LIMITED**  
**NICHOLAS SHOEBRIDGE**  
**JOHN BENT**  
**TE ĀPITI AHU WHENUA TRUSTEES**  
Section 274 Parties

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**JOINT MEMORANDUM OF COUNSEL FOR WAKA KOTAHI NZ TRANSPORT AGENCY AND TRANSPower NEW ZEALAND LIMITED**

6 July 2020

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## Introduction

1. This memorandum is filed jointly on behalf of Waka Kotahi NZ Transport Agency ("**Transport Agency**") and Transpower New Zealand Limited ("**Transpower**") in respect of the Transport Agency's application for resource consents for Te Ahu a Turanga: Manawatū Tararua Highway project (the "**Project**"), which is being determined by way of direct referral to the Environment Court.
2. Transpower lodged a section 274 interested party notice in respect of the proceedings on 17 June 2020 regarding the potential impacts of the Project on Transpower's assets (primarily, the National Grid).
3. The parties attended an initial mediation in Wellington on 22 June 2020 and have subsequently continued productive discussions regarding Transpower's concerns. As explained below, Transpower and the Transport Agency have now reached agreement as to how these concerns can be addressed.

## Agreement reached

4. The parties have reached an agreement on a set of appropriate responses to Transpower's concerns. These responses are set out in the table provided as **Attachment 1** to this memorandum.
5. The Transport Agency and Transpower agree that the table in Attachment 1 forms part of the record of these proceedings, and that the information provided in the table (in particular, the right-hand column) should therefore fall within the scope of proposed condition GA1(c), which requires the Transport Agency to carry out the Project in general accordance with the Transport Agency's application for resource consents, and that where there is inconsistency between the application documents and later plans and information provided at the Environment Court hearing, the most recent plans and information prevail. The Transport Agency proposes a minor amendment to proposed condition GA(1)(c) to further clarify this as follows (shown as a blue text amendment to the condition as attached to Ms Ainsley McLeod's evidence in chief):

*"Where there is inconsistency between the documents listed in clause (a), provided by the applicant as part of the application for resource consent, the applicant's response to the section 92 request for further information dated 29 April 2020, and information and plans provided at through the Environment Court process/hearing, the most recent plans and information prevail."*

6. Additionally, the Transport Agency and Transpower have agreed minor amendments to the proposed conditions (NG1 and NG2) which manage effects of the Project on the National Grid. These agreed amendments are provided as **Attachment 2** to this joint memorandum.
7. In light of the above, Transpower no longer opposes the Project, and takes a neutral position in respect of the application for resource consents for the Project. This being the case, Transpower no longer wishes to take an active part in this proceeding.
8. The Transport Agency will continue to work closely with Transpower to ensure that the potential effects of the Project on the National Grid are appropriately avoided and/or managed.

**Next steps**

9. In light of the above agreement, the expert conferencing on matters raised by Transpower, provisionally scheduled for 22 and 23 July, is no longer required.
10. The Transport Agency will include the condition amendments in Attachment 2 in the next suite of conditions provided to the Court and parties.

**DATED** this 6 day of July 2020



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**D G Randal / T J Ryan / F R Wedde  
Counsel for Waka Kotahi NZ Transport  
Agency**



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**A Beatson / H Watson  
Counsel for Transpower New Zealand  
Limited**

## Attachment 1 – Response of the Transport Agency’s witnesses to Transpower’s comments on evidence

Row No.	Transport Agency Witness	Extract from Transport Agency Witness EIC <sup>1</sup>	Paragraph & Page Ref	Transpower response/comments	Transport Agency witness response to Transpower comment
1.	<b>Damien McGahan</b> Planning Statutory	<i>NPS on Electricity Transmission 2008 ("NPSET"): The Project potentially requires conductors on the Mangamaire – Woodville A 110kV transmission line to be raised in order to achieve the necessary road surface clearance (both the construction and operational phase). As this action will be managed through proposed conditions, the Project will not hinder the operation and maintenance of the national electricity transmission activities, the Project is consistent with NPSET.</i>	Para 190(c) Pg. 46	<p>Issue is not just raising of conductors. The activity could have an impact on the foundations, generate EPR, restrict access, working areas around bases of poles (greater than 5m radii) etc...</p> <p>The evidence assumes the line raising is completed before they commence and that NZTA complies with all ECP34 clearances during construction.</p> <p>It is about managing the adverse effects on the asset – Policy 10/11.</p>	<p>Mr McGahan acknowledges the importance of ensuring all adverse effects on Transpower’s infrastructure and assets are appropriately avoided, remedied or mitigated.</p> <p>Mr McGahan acknowledges that assessment to date has been based on Alliance-based survey data. The Alliance now understands that a survey is not an appropriate method to assess conductor clearances. Transpower needs to conduct its own detailed analysis of the design (in DXF format) in relation to its infrastructure / asset(s).</p> <p>Mr McGahan understands that the Transport Agency and Alliance will continue to engage and work with Transpower regarding the outcomes of Transpower's analysis and feed this into the ongoing development of the detailed design.</p> <p>Mr McGahan considers that the proposed conditions framework (NG1; NG2; NG3) provides an appropriate framework for managing potential adverse effects on the National Grid. These conditions provide for a National Grid Management Plan ("<b>NGMP</b>") to be prepared, in consultation with Transpower, and provided to Horizons prior to the commencement of works within fifty metres of the MGM-WDV A assets. This builds on the requirement in designation condition T2 to prepare a</p>

<sup>1</sup> Damien MGahan EIC, Tim Watterson EIC, Anthony Adams EIC and Richard Chilton EIC, all dated 12 June 2020.

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					<p>NGMP. In practice, there will be one NGMP prepared that satisfies both sets of conditions.</p> <p>The objective of the NGMP is to ensure that any potential adverse effects of the Project on the operation and maintenance of the MGM-WDV-A assets are appropriately managed; as well as to ensure that specific requirements are met (including in relation to clearances (NG1(b)); access (NG1(c)); and compliance with NZECP34 (NG1(d)).</p> <p>Following mediation, Mr McGahan understands that Transpower is comfortable with the conditions framework, and on that basis considers the conditions are appropriate to manage any potential adverse effects on the National Grid. However, if Transpower provides further comments on conditions, he is happy to consider these.</p>
2.		<p><i>(g) NES for Electricity Transmission Activities 2009 ("NESETA"): As noted above, the Project potentially requires raising the level of the conductors to achieve the necessary clearance from the road. <b>At this stage, the required height change is expected to be within the permitted activity status threshold, and as such, no consent is required.</b></i></p>	<p>Para 190(g) Pg. 46</p>	<p>TP doesn't know if the Project meets NESETA or if consent is required as the detailed <b>electrical engineering</b> assessment hasn't been completed. Height of structures has not yet been designed, a 15% additional increase in height, triggering non-compliance is a very real possibility. Pole foundation excavations are not covered by NESETA and will require consent.</p>	<p>Please see Mr McGahan's response to row 1.</p>
3.		<p><i>Mr Watterson has confirmed that all necessary clearances from Transpower's assets can be achieved under this configuration.</i></p>	<p>Para 281 Pg. 70</p>	<p>This is a key issue for TP. This statement is based on a survey (only) of the lines, rather than a detailed engineering assessment and is therefore incorrect. Whether or not clearances are met is yet to be determined as detailed electrical engineering assessment hasn't been completed.</p>	<p>Please see Mr McGahan's response to row 1.</p>

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				TP is not yet confident that this is the case - the final design has not yet been reviewed and confirmed as correct by TP, and in our experience modelling errors are common.	
4.		<p><i>However, I note that construction and operational clearances and other requirements are subject to Transpower's own detailed analysis and this will occur over the coming 3-4 months. I understand though that Transpower are comfortable with the conditions proposed by Ms McLeod. This includes a potential condition precedent, as proposed by Transpower in its submission, and the replication of a condition similar to Designation Condition T2 (discussed below) to be imposed on the resource consents. The imposition of such conditions will ensure that its assets are appropriately safeguarded during construction and once the Project is operational.</i></p>	Para 283 Pg. 70	<p>Noted: This witness is the only person to acknowledge clearances are subject to TP's own detailed analysis. Also only one to note we are happy with Conditions proposed.</p> <p>Suggest clearances to be checked by TP are all clearances and not just limited to construction and operational clearances.</p>	<p>Mr McGahan confirms his understanding that clearances are subject to Transpower's own detailed analysis as explained above in row 1.</p> <p>Mr McGahan confirms his understanding that Transpower is comfortable with the proposed conditions.</p>
5.	Tim Watterson Design	<p><i>With respect to the design coordination of the modified four-arm roundabout with existing Transpower assets in this area, I attended a meeting with Transpower via video call on Tuesday, 12 May 2020, during which the Alliance representatives discussed the modified four-arm roundabout design, including where it interfaces with Transpower assets. <b>The Alliance representatives confirmed at this meeting that the New Zealand Electrical Code of Practice for Electrical Safe Distance (NZECP 34:2001) guidelines have been used to confirm all clearance requirements are met in relation to works around Transpower assets.</b> There have also been two further meetings held with Transpower to discuss these matters on 9 and 10 June 2020.</i></p>	Para 79 Pg.23	<p>The assessment is not just limited to NZECP – see below.</p> <p>The Alliance's conclusion that all clearance requirements have been met is based on a survey. This is a fundamental misunderstanding and error in the evidence.</p> <p>This clearance cannot be confirmed until a detailed electrical engineering assessment has been completed.</p> <p>Transpower is not yet confident that this is the case, the final comprehensive design has not yet been reviewed and confirmed as correct by TP, and in its experience modelling errors are common.</p>	<p>Mr Watterson acknowledges the importance of ensuring all adverse effects on Transpower's infrastructure and assets are appropriately avoided, remedied or mitigated.</p> <p>Mr Watterson acknowledges that assessment to date has been based on Alliance-based survey data. Mr Watterson now understands a survey is not an appropriate method to determine conductor clearances. Transpower needs to conduct its own detailed analysis of the design in relation to its infrastructure / asset(s).</p> <p>Mr Watterson confirms that the Alliance will continue to engage and work with Transpower regarding the outcomes of Transpower's analysis and feed this into</p>

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					the ongoing development of the detailed design.
6.		<p><i>At the meeting on 12 May 2020 the Alliance representatives also explained the design requirement that the final design will maintain all safe distance requirements and access to Transpower assets, which includes giving due consideration to the level of the proposed roundabout and the location and height of the roadside features (e.g. road traffic signage and lighting poles). The roadside features were discussed in detail at the meeting, and in subsequent email communications with Transpower.</i></p>	Para 80 Pg.23	<p>These roadside features are not included in the Consent drawings. TP presently has no confidence in the location height and clearance of said ancillary structures, in addition clearance during the maintenance of said structures by EWP or others appears not to have been considered despite several requests.</p>	<p>Mr Watterson acknowledges that the roadside features are not in the consent drawings lodged. Mr Watterson understands that indicative plans including these features were provided to Transpower by email (to Mike Burrow and Nisa Titus on 5 June 2020), but acknowledges that these plans are still under review by Transpower. Mr Watterson acknowledges that Transpower requires final DXF to confirm the impact of the Project on Transpower's assets, including clearances.</p> <p>Mr Watterson confirms that the design of these features is on hold until feedback is received from Transpower. When this feedback is provided, the Alliance will adjust the design and plans as necessary.</p>
7.		<p><b>The Alliance has assessed that the minimum clearances will be achieved and have confirmed this to Transpower.</b> Discussions with Transpower remain ongoing. These communications related to the following infrastructure:</p> <p>(a) Location and levels of the proposed SUP;</p> <p>(b) Construction activities associated with the roundabout construction (addressed in further detail in Mr Adams' evidence, in terms of the construction methodology and temporary access proposed for roundabout construction adjacent to the existing Transpower assets);</p> <p>(c) Location, levels and depth of proposed road drainage assets including culverts, wetland swales, stream</p>	Para 81-82 Pg23-24	<p>This is a key issue for Transpower. Transpower has advised the Alliance that the assessment is not complete due to the reliance upon surveyed conductor positions.</p> <p>Transpower has advised the Alliance on numerous occasions that the clearance assessment to conductors needs to be undertaken by Transpower. In Transpower's experience when third party modelling is undertaken errors are common.</p> <p>We can't confirm at this stage clearances are achieved as detailed electrical engineering assessment hasn't been completed and approved, such design has yet to commence.</p>	Please see Mr Watterson's responses in rows 5 and 6 above.

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		<p><i>diversions and network drainage systems;</i>  <i>(d) Location and levels of the proposed road lighting poles;</i>  <i>(e) Location and levels of the proposed road traffic signage;</i>  <i>(f) Location and levels of the proposed roadside safety barriers;</i>  <i>(g) Type, height and location of proposed landscaping works; and</i>  <i>(h) Existing and proposed underground utilities (e.g. telecommunications, water and electrical high-voltage and low-voltage services).</i></p> <p><i>As such, the Project's design and construction will address all of the matters raised in Transpower's submission.</i></p>		<p>Earlier alliance evidence states in one part "possibility of raising two structures," and in another point that the raising of two structures will be within NESETA limits". Here it is stated that "the minimum clearances will be achieved." Evidence is inconsistent – highlighting the general lack of understanding of how to assess clearances between the project and transmission lines.</p> <p>The consent drawings do not include the following items which were shown in drawings previously provided to Transpower:</p> <ul style="list-style-type: none"> <li>• Street lights</li> <li>• Road signs</li> <li>• Semi-rigid barrier around the poles</li> <li>• Access to poles</li> </ul> <p>We also haven't seen the temporary access that is mentioned in (b).</p> <p>Other utilities are indicated in "Attachment TA.1 Transpower Clearance Drawings" but not in the overview drawings, same with the streetlights. The materials should be consistent – details should be shown in the overview drawings as well.</p> <p>TP has not been provided with latest drawings.</p>	
8.		<p><i>Further, this information is required to be collated in a National Grid Management Plan, which is a stipulation of Designation Condition T2. <b>Under that condition, the Transport Agency is required to demonstrate compliance with NZECP 34:2001 and address the other matters raised in Transpower's current submission.</b></i></p>	Para 83 Pg.24	<p>The designation conditions only apply to works authorised by the designation – TP's concerns relate to the bulk earthworks consent (and conditions) now being applied for.</p>	<p>Mr Watterson confirms that a NGMP is now required both under designation condition T2 and proposed resource consent conditions NG1 – NG3. Mr Watterson understands that both sets of conditions require the NGMP to demonstrate compliance with NZECP34.</p>



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9.		<p><i>The Alliance will continue to liaise with Transpower, and I note that following a meeting with Transpower on the 9 June 2020, <b>additional resource consent conditions have been proposed to address Transpower's concerns. These include the requirement for compliance with the NZECP, and for a National Grid Management Plan if construction works are being undertaken in the vicinity of the 110kV National Grid transmission line. These are discussed in detail in the evidence of Ms McLeod.</b></i></p>	<p>Para 84 Pg.24</p>	<p>They also require no works until it is confirmed how TP assets are affected, whether requirements are met and if assets need to be moved/changed.</p> <p>Compliance is not limited to NZECP 34 – also TPD12.02 and electrical regulations.</p> <p>In addition, compliance is required for the construction, maintenance and operation of the road as well as the operation and maintenance of TP assets which has yet to be comprehensively demonstrated.</p>	<p>Mr Watterson understands that Transpower will be able to raise all relevant requirements and standards as part of its review of design, and consultation on the NGMP and that in practice, the NGMP will not be lodged with Horizons until Transpower is comfortable with it. Mr Watterson hopes this provides Transpower with additional assurance.</p>
10.	<p><b>Anthony Adams</b> Construction Methodology</p>	<p><i><b>Again, there is a designation condition in effect that will ensure that the issues identified by Transpower are worked through with the submitter and addressed...</b></i></p>	<p>Para 47 Pg.11</p>	<p>Transpower considers Designation Conditions are not sufficient and they only kick in as an Outline Plan requirement. They don't cover off all matters in this submission which is why we have asked for additional conditions.</p>	<p>Mr Adams acknowledges the importance of ensuring all adverse effects on Transpower's infrastructure and assets are appropriately avoided, remedied or mitigated.</p> <p>Mr Adams acknowledges that assessment to date has been based on Alliance-based survey data, which has not yet been verified by Transpower and that Transpower needs to conduct its own detailed analysis of the design in relation to its infrastructure / asset(s).</p> <p>Mr Adams confirms that the Alliance will continue to engage and work with Transpower regarding the outcomes of Transpower's analysis and feed this into the ongoing development of the detailed design and associated construction methodologies.</p> <p>Mr Adams confirms that a NGMP is now required both under designation condition T2 and proposed resource consent conditions NG1 – NG3.</p>

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					Mr Adams understands that Transpower will be able to raise all relevant requirements and standards as part of its review of design, and consultation on the NGMP and that in practice, the NGMP will not be lodged with Horizons until Transpower is comfortable with it. Mr Adams hopes this provides Transpower with additional assurance.
11.		<i>Furthermore, in response to electrical clearance concerns, there is a designation condition (number 32) in place that requires compliance with the NZECP...</i>	Para 48 Pg.13	<p>NZECF is not the only requirement. Transpower has specific design clearance requirements between its conductors and roads.</p> <p>Transpower considers Designation Conditions are not sufficient and they only kick in as an Outline Plan requirement. They don't cover off all matters in this submission which is why we have asked for additional conditions.</p>	Please see Mr Adam's responses in row 10 above.
12.		<p><i>Beyond that, I respond as follows to the concerns relating to construction of the Project raised by Transpower:</i></p> <p><i>(a) No stockpiling of earthworks is proposed within the NZECP safe clearance requirements. <b>All other procedures within this clearance distance will not occur until all necessary approvals have been obtained from Transpower.</b></i></p>	Para 49(a) Pg.13	<p>It should not be assumed that dispensations for earthworks can or will be provided, they are a last resort. The proposal to allow for dispensation rather than achieving design clearances is not engineering best practice and is concerning. Dispensations are very rarely given.</p> <p>Perhaps mention NZECP34 + 0.5m for possible conductor location error as per TPD 12.02</p>	<p>Mr Adams notes and accepts the advice from Transpower that dispensations for earthworks will not necessarily be provided, and should be considered a measure of last resort.</p> <p>As noted above in row 10, Mr Adams acknowledges that further work is required to ensure that adverse effects on the National Grid will be appropriately managed, including Transpower having the opportunity to review detailed plans and complete their own assessment, feeding that assessment into the detailed design, and consulting with Transpower on the NGMP, which must be provided to Horizons before any works in the vicinity of the MGM-WDV-A assets occur.</p>
13.		<b>All work located at the Eastern Roundabout has been designed to avoid the relocation of Transpower assets, including poles 11 to 15, by</b>	Para 49(b) Pg.13	Detailed analysis by Transpower has not yet commenced and so whether relocation or modification of TPs assets is required is yet to be determined. A	As noted above in row 10, Mr Adams confirms his understanding that further work is required to confirm whether

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		<p><i>providing a minimum pole clearance zone to minimise effects to each asset. There will be a minimum clearance of at least 9.5 m from the pavement finish level to the Transpower conductors.</i></p>		<p>minimum clearance of 10m is required in accordance with agreed conditions.</p>	<p>relocation or modification of Transpower's assets is required.</p> <p>Mr Adams confirms his understanding that proposed condition NG1 requires a minimum clearance of 10m.</p> <p>Mr Adams has noted an error in his evidence, which mistakenly refers to poles 11 to 15. This should be a reference to poles 11 to 14, which are all within the designation. Of these four poles, Mr Adams considers that only three will be potentially affected by the Project works:</p> <ul style="list-style-type: none"> <li>• Pole 11 is at the northern end of the site and will be very close to the Project site;</li> <li>• Pole 12 is opposite Stanley Street and within the Project site; and</li> <li>• Pole 13 is near the roundabout and within the Project site.</li> </ul> <p>Pole 14 is also within the designation, but this is 150m south of the Project site and unlikely to be affected by the Project works.</p> <p>For all poles, Mr Adams confirms his understanding that Transpower will need to conduct its own assessment to confirm if any have the potential to be adversely affected by the Project works. Mr Adams is happy to reconsider if Transpower considers that Pole 14 or other poles may also be affected by the Project works.</p>
14.		<p><i>The latest generation Caterpillar excavators are equipped with 2d E Fence technology (maximum height lockouts) that will not allow the boom to go higher</i></p>	<p>Para 49(d) Pg.14</p>	<p>Transpower <b>will not</b> provide consent/dispensations to encroach within the 4m clearance.</p>	<p>Mr Adams notes and accepts Transpower's advice that it will not provide dispensation to encroach within the 4m clearance.</p>

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		<p>than a pre-set height, thereby eliminating the risk of operator error leading to a breach of the exclusion zone. All construction works will be planned to be completed so that all plant and personnel stay at least 4 m from the conductors at all times. <b>If there are isolated works that cannot be completed without breaching the 4m clearance, specific consent will be sought from Transpower, in accordance with NZECP requirements.</b></p>		<p>Suggest approved safety observer would be required for any construction activity that has the potential to come within 1.0m of the 4m (+0.5m) NZECP34 live line clearance as per TPDL 12.02.</p> <p>TP may enter into negotiations to turn line off.</p>	<p>Mr Adams notes the suggestion for an approved safety observer for any construction activity with the potential to come within 1m of the 4m clearance zone and suggests that this is considered as part of developing the NGMP, which must be developed in consultation with Transpower and submitted to Horizons before works commence in the vicinity of the MGM-WDV-A assets.</p>
15.		<p>Appropriate pennant flagging will also be installed on all approaches to conductors to warn operators of the hazard. This is shown within the drawings annexed to my evidence as <b>Attachment TA.1 – Transpower Clearance Drawings. Please note that these drawings are indicative to show gross clearances, and there needs to be more survey work completed to fully confirm accurate clearances with respect to the entirety of Transpower’s assets.</b></p>	Para 49(e) Pg.14	<p>Detailed electrical engineering is required by Transpower, not survey work by the Alliance. Surveys of conductors only show the location of a conductor at that exact point in time. Conductor positions change all the time due to a number of factors including weather conditions, load going through the conductor etc. Transpower analysis takes all of these critical factors into account and analysis is undertaken against a worst case scenario conductor position. Refer to previous comments.</p> <p>Suggest approved safety observer would be required for any construction that had the possibility of coming within 1.0m of the 4m (+0.5m) NZECP34 live line clearance.</p>	<p>Mr Adams acknowledges that the plan in Attachment TA.1 is preliminary and requires further development and discussion with Transpower as referred to above in his response in row 10.</p> <p>As noted above in row 14, Mr Adams proposes that the suggestion for an approved safety observer is considered as part of the development of the NGMP, which must be developed in consultation with Transpower.</p>
16.		<p>The Alliance will continue to liaise with Transpower to determine its access requirements to the <b>two poles</b> and conductors located at the Eastern Roundabout and tie-ins footprint of works.</p>	Para 49(h) Pg.14	<p>Four poles?</p> <p>TP requires access to all the poles within their designation. TP needs to maintain 24hr 7 day a week access during and after construction to no less a standard than the access currently in place.</p>	<p>As explained above in row 13, Mr Adams understands that three poles (Poles 11, 12 and 13) may potentially be affected by the Project works. Mr Adams is happy to reconsider this if Transpower considers that Pole 14 or other poles may also be affected by the Project works.</p> <p>Mr Adams understands that the NGMP must ensure that access to MGM-WDV-A assets is maintained during</p>

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					<p>construction: at all times for emergency works; and at reasonable times for maintenance (NG1(c)). In addition, Mr Adams understands that Transpower can raise ongoing access requirements during the operation of the Project as part of Transpower's review of detailed design as referred to in his response above in row 10.</p>
17.	<p><b>Richard Chilton</b> Air Quality</p>	<p><i>I address at paragraph 85 of Technical Assessment E the potential effect of dust on Transpower's transmission infrastructure... In Technical Assessment E, I conclude that <b>construction works associated with the Eastern Roundabout are unlikely to give rise to suspended dust concentrations that could cause arcing (referred to as 'flashovers' in Transpower's submission) across conductors due to the following factors:</b></i></p> <p><i>(a) the height above ground of the conductors, providing vertical separation. In this regard, the evidence of Mr Adams explains that a minimum clearance of 9.5 m from the pavement finished level to the Transpower conductors will be maintained;</i></p> <p><i>(b) the high suspended dust concentrations that would be required for arcing to occur;</i></p> <p><i>(c) the relatively small scale and nature of dust generating activities associated with the construction of the roundabout; and</i></p> <p><i>(d) the requirement contained in the DCP (Appendix 3 to the ESCP) to manage dust nuisance impacts at nearby residences, which will include continuous dust monitoring to ensure the efficacy of those control measures. By extension, these measures will also</i></p>	<p>Para 22 Pg.8-9</p>	<p>Is this expert properly qualified to make these comments regarding flashovers/arching?</p> <p>TP's concern is not re dust concentrations allowing flash 9.5m from lowest mid span clearance to ground. If it was, it would be to the closer NZECP34 clearance of 4.0m to their machinery.</p> <p>The concern relates to dust settlement on the glass insulators that attach each phase to our poles. The insulator indicative length is only 1.02m. Dust settlement combined with evening dew or light rain has in the past allowed electricity to flow over the surface of the insulator, liven the cross arm, pole and surrounding ground at the base of the pole to 111,000 volts.</p> <p>That said, if the points made within c&amp;d are correct this effect should be capable of management.</p> <p>We suggest a condition - have dust monitoring station near one of TP's two closest poles and visual observation of dust build up on insulators is to be conducted daily.</p>	<p>Mr Chilton confirms that the dust control procedure measures aim to control dust to low levels in order to be acceptable for the nearby high-sensitivity residential dwellings from a relatively small-scale earthworks activity.</p> <p>Accordingly, Mr Chilton expects that deposition levels will not reach a level that could cause effects on the National Grid.</p> <p>However, for additional certainty, Mr Chilton agrees that conditions NG1 – NG2 can be amended as proposed by Ms McLeod in <b>Attachment 1</b>. This provides for dust monitoring within 120m metres of poles 12 and 13 and installation of deposition monitors in the immediate vicinity of those two poles.</p> <p>Mr Chilton considers the suggestion of daily visual observations may not be practicable given the need to inspect the insulators at height. Instead, daily checks for the effectiveness of dust control measures in the vicinity of the poles is recommended. If this is accepted by Transpower, this can be incorporated into the Dust Control Procedure. The amendments to conditions proposed by Ms McLeod provide for this.</p>

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		<i>address the issues of concern to Transpower's elevated infrastructure.</i>			
18.		<i>I note the evidence of Mr Watterson, where he responds to the submission by Transpower, describes a modification to the proposed Eastern Roundabout that reduces its overall footprint (and associated earthworks and pavement areas). In my opinion, <b>such a reduction in the footprint of earthworks will assist in further minimising dust emissions and associated potential dust impacts on Transpower's infrastructure.</b></i>	Para 23 Pg.9	Transpower will need to confirm this.	Mr Chilton acknowledges that Transpower is still considering this and confirms his opinion that the reduced footprint of earthworks will assist to minimise further dust emissions.
19.		<i>For the above reasons that I have set out in response to arcing, <b>I consider that dust emissions will not result in significant accumulation or wear on Transpower's infrastructure.</b></i>	Para 24 Pg.9	Is this witness properly qualified to make this comment?	Please see Mr Chilton's responses in row 17 above.

## Attachment 2 – Agreed amendments to NG1 – NG2

Amendments to the proposed conditions attached to Ms McLeod's evidence of 12 June 2020 are shown in blue text.

<b>National Grid</b>	
<u>NG1</u>	<p><b>National Grid Management Standards</b></p> <p>a) <u>Construction works must not commence within fifty (50) metres of the centreline of the Mangamaire – Woodville A 110kV National Grid overhead transmission assets (“MGM-WDV-A assets”) until the National Grid Management Plan required by Condition NG2 have been completed and either:</u></p> <ul style="list-style-type: none"><li>i. <u>the construction and operation of the Project has been designed to comply with Clause (b) and Clause (d); or</u></li><li>ii. <u>the MGM-WDV-A assets have been relocated or altered to enable the construction and operation of the Project.</u></li></ul> <p>b) <u>Earthworks must be designed and constructed to ensure that the vertical clearance between the MGM-WDV-A transmission line conductors and the finished road level of the state highway (including approach roundabouts and on/off ramps) is a minimum of 10 metres.</u></p> <p>c) <u>A dust monitoring station must be located 120 metres from MGM-WDV-A pole 12 or pole 13;</u></p> <p>d) <u>Access to the MGM-WDV-A assets:</u></p> <ul style="list-style-type: none"><li>i. <u>is maintained at all times during construction for emergency works;</u></li><li>ii. <u>is maintained at reasonable times during construction for maintenance.</u></li></ul> <p>e) <u>Construction works and associated activities must be designed and undertaken to comply with the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001).</u></p>
<u>NG2</u>	<p><b>National Grid Management Plan</b></p> <p>a) <u>A National Grid Management Plan (NGMP) must be prepared in consultation with Transpower New Zealand Limited prior to any construction works, or enabling works, being undertaken within fifty (50) metres of the MGM-WDV-A assets.</u></p> <p>b) <u>The NGMP must be submitted to Manawatū-Whanganui Regional Council at least fifteen (15) working days prior to the commencement of works in the area described in Condition NG1(a).</u></p> <p>c) <u>The objectives of the NGMP are to ensure works are carried out safely; to manage potential adverse effects of the Project on the operation and maintenance of the MGM-WDV-A assets; and to</u></p>

demonstrate how compliance with Condition NG1(b) to NG1(d) will be achieved for the duration of construction of the Project.

d) The NGMP must, as a minimum:

- i. be prepared in consultation with Transpower New Zealand Limited;
- ii. include details of the consultation undertaken, including measures taken to respond to Transpower's comments and feedback;
- iii. demonstrate how construction works and associated activities are designed and undertaken to comply with Conditions NG1(b) to NG1(d);
- iv. outline measures to manage induced and transferred voltages, and earth potential rise, where conductive material is within close proximity to the MGM-WDV-A assets;
- v. identify areas where additional management measures are necessary such as fencing or hurdles;
- vi. outline measures to monitor, and manage the effects of, dust that may damage the MGM-WDV-A assets, including through dust deposition monitoring in the vicinity of pole 12 and pole 13 and other measures set out in the Dust Control Procedure attached as Appendix C to the ESCP; and
- vii. outline details of proposed contractor training, and Transpower New Zealand Limited's involvement in that training, for those working within 12 metres of the transmission line support structures or within the maximum extent of conductor swing (at maximum operating temperature).