

# Modification Notice - Regulation 22

Interest Holder	Santos QNT Pty Ltd	EMP Title	EP161 2D Seismic and Ground Gravity Survey Program	Unique EMP ID No.	STO7-4	Change/Mod No.	3	Date	01/11/2024
Brief Description	The modifications to the EMP provide allowances for minor detours outside the established 50 m working corridor during seismic surveys, specifically in instances where hazards (e.g. washed out creek banks) pose environmental and safety risks that would be exacerbated by adhering to the established corridor limits. Necessary detours will not increase the disturbance area of the seismic lines and will only be undertaken in instances where adhering to the defined corridor would increase environmental and operational risks.								
Geospatial Files Included?	No								
Does the proposed change result in a new, or increased, potential or actual environmental impact or risk?	If an INCREASE in an existing potential or actual environmental impact or risk, is it provided for in the approved EMP?	Does the proposed change require additional mitigation measures to be included?	Has additional stakeholder engagement been conducted?	Does it require additional environmental performance standards and measurement criteria?	Does it affect compliance with Sacred Site Authority Certificates?	Does it affect current rehabilitation, weed, fire, wastewater, erosion and sediment control, spill or emergency response plans?	Will the environmental outcome continue to be achieved and will the impacts and risks be managed to ALARP and acceptable?		
No	N/A	No	No	No	No	No	Yes		
Current EMP Text				Amended EMP Text					
<p><b>2.4 Ecologically Sustainable Development</b></p> <p>Ecologically Sustainable Development (ESD) is defined in the EP Act as 'development that improves the total quality of human life, both now and in the future in a way that:</p> <ul style="list-style-type: none"> <li>• Maintains the ecological processes on which all life depends.</li> <li>• Recognises the need for development to be equitable between current and future generations.'</li> </ul>				<p><b>2.4 Ecologically Sustainable Development</b></p> <p>Ecologically Sustainable Development (ESD) is defined in the EP Act as 'development that improves the total quality of human life, both now and in the future in a way that:</p> <ul style="list-style-type: none"> <li>• Maintains the ecological processes on which all life depends.</li> <li>• Recognises the need for development to be equitable between current and future generations.'</li> </ul>					

The principles of ESD, as referenced in the *Petroleum Act 1984*, are set out in Sections 17 - 24 of the *EP Act*. In determining whether to approve an EMP, the Minister must consider and apply those principles. In the preparation of this EMP, the following points were considered regarding the principles of ESD:

- The Activity will occur over a short time using an existing well pad for the temporary campsite and an existing access road and tracks that limit new preparation and minimises cumulative impacts (relevant to the principles set out in ss 19 and 21 of the *EP Act*).
- On-site assessments have identified that vegetation within the Project Area is predominantly sparse woodland (up to 85%). Therefore, traversing without line preparation will be feasible for much of the seismic line length. The nominal 50 m seismic line corridors will allow deviation around potential obstacles and key environmental sensitivities (e.g., mature trees, trees with active hollows or nests) where practicable and cultural sites can be avoided. Mature trees, trees with active hollows or nests selected for preservation, would be recorded, and flagged to ensure their protection.
- In areas with high-density vegetation, a mulcher or slasher may need to be used to enable safe passage for the seismic vehicle convoy and to provide sufficient ground contact for the vibro-source and geophones.
- A mulcher cuts and mulches vegetation and spreads the mulch on the seismic line for minimal impact and rapid rehabilitation. For both a mulcher and slasher the soil is not disturbed, and the vegetation rootstock is not cleared.
- Where preparation is required, only a 5 m width within the notional 50 m seismic line corridor or connection line corridor will be prepared, allowing for deviation around potential obstacles and key environmental sensitivities (e.g., mature trees, trees with active hollows or nests) where practicable, and cultural sites can be avoided.
- In the final ground truthing along the seismic and connection line routes to identify significant trees, the presence of any riparian vegetation would also be recorded. Seismic vehicles may traverse these areas where the density of vegetation allows safe passage of vehicles with no line preparation. Vegetation slashing or mulching may be required for access but will follow the riparian

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- The Activity will occur over a short time using an existing well pad for the temporary campsite and an existing access road and tracks that limit new preparation and minimises cumulative impacts (relevant to the principles set out in ss 19 and 21 of the *EP Act*).
- On-site assessments have identified that vegetation within the Project Area is predominantly sparse woodland (up to 85%). Therefore, traversing without line preparation will be feasible for much of the seismic line length. The nominal 50 m seismic line corridors will allow deviation around potential obstacles and key environmental sensitivities (e.g., mature trees, trees with active hollows or nests) where practicable and cultural sites can be avoided. Mature trees, trees with active hollows or nests selected for preservation, would be recorded, and flagged to ensure their protection. In instances where minor detours outside this corridor may be required to minimise environmental impacts and maintain safe and ALARP working conditions, it will be ensured that environmental and cultural sensitivities will be avoided.
- In areas with high-density vegetation, a mulcher or slasher may need to be used to enable safe passage for the seismic vehicle convoy and to provide sufficient ground contact for the vibro-source and geophones.
- A mulcher cuts and mulches vegetation and spreads the mulch on the seismic line for minimal impact and rapid rehabilitation. For both a mulcher and slasher the soil is not disturbed, and the vegetation rootstock is not cleared.
- Where preparation is required, only a 5 m width within the notional 50 m seismic line corridor or connection line corridor will be prepared, allowing for deviation around potential obstacles and key environmental sensitivities (e.g., mature trees, trees with active hollows or nests) where practicable, and cultural sites can be avoided. In instances where detours are required outside the 50 m corridor to avoid sensitive areas and environmental hazards, these detours will also be restricted to no more than 5 m of disturbance width.

<p>vegetation decision tree shown in <b>Figure 3.5—13</b>. Where suitable, watercourse crossing points are not possible, existing access tracks will be used. Small portable nodal geophones may also be used in riparian areas for data acquisition.</p> <ul style="list-style-type: none"><li>• In easily traversable terrain, there will be no line preparation. Similarly, no line preparation will be required in areas where seismic lines intersect existing cleared areas, e.g., existing access tracks and the Carpentaria highway.</li><li>• An archaeological study undertaken in July 2023 (<b>Appendix 02</b>) has identified four significant sites in the Project Area. Seismic lines have been adjusted so that all four sites are avoided.</li><li>• No new groundwater bores are required. Water required to maintain existing tracks, dust suppression or firefighting water will be sourced from existing, licenced water bore(s).</li><li>• All the identified environmental risks identified were assessed as low or very low if the Activity is conducted in accordance with the controls described in the EMP and its Appendices (including those required for compliance with <i>the Code</i>). All identified risks have been assessed and reduced to a level considered ALARP and acceptable (relevant to the principles set out in ss 19 and 21 of the <i>EP Act</i>).</li><li>• Mitigation measures are in place to prevent or minimise any impact on threatened species; therefore, the Activity does not require referral under the <i>EPBC Act</i> for a decision on whether the Activity is a controlled action (relevant to the principles set out in ss 23).</li><li>• The Interest Holder engaged third-party, suitably qualified independent consultants to complete on-ground ecological and cultural heritage surveys to inform a detailed description of the environment and site-specific risk controls (relevant to the principles set out in ss 19, 20, 23 and 26 of the <i>EP Act</i>).</li><li>• Site-specific plans (Erosion and Sediment Control, Weed Management, Fire Management, Rehabilitation Management, Waste Management, Emergency Response, and Spill Management) have been created, all of which aim to prevent and mitigate foreseeable risks and respond to an unwanted event if</li></ul>	<ul style="list-style-type: none"><li>• In the final ground truthing along the seismic and connection line routes to identify significant trees, the presence of any riparian vegetation would also be recorded. Seismic vehicles may traverse these areas where the density of vegetation allows safe passage of vehicles with no line preparation. Vegetation slashing or mulching may be required for access but will follow the riparian vegetation decision tree shown in <b>Figure 3.5—13</b>. Where suitable, watercourse crossing points are not possible, existing access tracks will be used. Small portable nodal geophones may also be used in riparian areas for data acquisition.</li><li>• In easily traversable terrain, there will be no line preparation. Similarly, no line preparation will be required in areas where seismic lines intersect existing cleared areas, e.g., existing access tracks and the Carpentaria highway.</li><li>• An archaeological study undertaken in July 2023 (<b>Appendix 02</b>) has identified four significant sites in the Project Area. Seismic lines have been adjusted so that all four sites are avoided.</li><li>• No new groundwater bores are required. Water required to maintain existing tracks, dust suppression or firefighting water will be sourced from existing, licenced water bore(s).</li><li>• All the identified environmental risks identified were assessed as low or very low if the Activity is conducted in accordance with the controls described in the EMP and its Appendices (including those required for compliance with <i>the Code</i>). All identified risks have been assessed and reduced to a level considered ALARP and acceptable (relevant to the principles set out in ss 19 and 21 of the <i>EP Act</i>).</li><li>• Mitigation measures are in place to prevent or minimise any impact on threatened species; therefore, the Activity does not require referral under the <i>EPBC Act</i> for a decision on whether the Activity is a controlled action (relevant to the principles set out in ss 23).</li><li>• The Interest Holder engaged third-party, suitably qualified independent consultants to complete on-ground ecological and cultural heritage surveys to inform a detailed description of the environment and site-specific risk controls (relevant to the principles set out in ss 19, 20, 23 and 26 of the <i>EP Act</i>).</li><li>• Site-specific plans (Erosion and Sediment Control, Weed Management, Fire Management, Rehabilitation Management, Waste Management, Emergency</li></ul>
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<p>one was to occur (relevant to the principles set out at ss 19, 21, 25, 26 and 27 of the <i>EP Act</i>).</p> <ul style="list-style-type: none"> <li>Stakeholders (including Traditional Owners and Pastoralists) that may be affected by the Activity have been identified and engaged (relevant to the principles set out at ss 18, 20, 21 and 22 of the <i>EP Act</i>).</li> <li>The Interest holder has strategies in place to engage local businesses, facilities, suppliers, and promote the employment of local/regional people (relevant to the principle set out in ss 21 of the <i>EP Act</i>).</li> <li>The area utilised for this EMP will be rehabilitated at the cessation of all approved Activity (relevant to the principles set out at ss 18,19, 21 and 23 of the <i>EP Act</i>) in accordance with the Rehabilitation Management Plan. Activity in areas previously used for the Interest Holder’s exploration activity in the Project Area are covered by the respective EMPs for those operations.</li> </ul>	<p>Response, and Spill Management) have been created, all of which aim to prevent and mitigate foreseeable risks and respond to an unwanted event if one was to occur (relevant to the principles set out at ss 19, 21, 25, 26 and 27 of the <i>EP Act</i>).</p> <ul style="list-style-type: none"> <li>Stakeholders (including Traditional Owners and Pastoralists) that may be affected by the Activity have been identified and engaged (relevant to the principles set out at ss 18, 20, 21 and 22 of the <i>EP Act</i>).</li> <li>The Interest holder has strategies in place to engage local businesses, facilities, suppliers, and promote the employment of local/regional people (relevant to the principle set out in ss 21 of the <i>EP Act</i>).</li> </ul> <p>The area utilised for this EMP will be rehabilitated at the cessation of all approved Activity (relevant to the principles set out at ss 18,19, 21 and 23 of the <i>EP Act</i>) in accordance with the Rehabilitation Management Plan. Activity in areas previously used for the Interest Holder’s exploration activity in the Project Area are covered by the respective EMPs for those operations.</p>
<p><b><u>2.5.2 Referral Under the Environment Protection Act 2019 (EP Act)</u></b></p> <p>Under the EP Act, proposed actions that may have a significant impact on the environment are required to be referred to the NT EPA for assessment.</p> <p>The Interest Holder has assessed the Activity using the pre-referral screening tool in the NT EPA’s Referring a Proposal to the NT EPA: Environmental Impact Assessment Guidance for Proponents [NT EPA, 2021]. This self-assessment took the following points into consideration:</p> <ul style="list-style-type: none"> <li>There is no anticipated impact on the variety and integrity of distinctive physical landforms, given that the primary access track to the campsite at the Tanumbirini well pad is pre-existing, and that the area used for the Activity will be rehabilitated to its pre-disturbance condition.</li> <li>The seismic lines will be operated within a notional 50 m working corridor 25 m on each side of the nominal seismic centre line. Much of the area to be surveyed is open woodland; in these areas minimal line preparation work will be required for access by survey vehicles. Mature trees, trees with active hollows or nests selected for preservation, would be recorded, and flagged to ensure their protection during final ground truthing prior to line preparation.</li> </ul>	<p><b><u>2.5.2 Referral Under the Environment Protection Act 2019 (EP Act)</u></b></p> <p>Under the EP Act, proposed actions that may have a significant impact on the environment are required to be referred to the NT EPA for assessment.</p> <p>The Interest Holder has assessed the Activity using the pre-referral screening tool in the NT EPA’s Referring a Proposal to the NT EPA: Environmental Impact Assessment Guidance for Proponents [NT EPA, 2021]. This self-assessment took the following points into consideration:</p> <ul style="list-style-type: none"> <li>There is no anticipated impact on the variety and integrity of distinctive physical landforms, given that the primary access track to the campsite at the Tanumbirini well pad is pre-existing, and that the area used for the Activity will be rehabilitated to its pre-disturbance condition.</li> <li>The seismic lines will be operated within a notional 50 m working corridor 25 m on each side of the nominal seismic centre line. In instances where environmental hazards such as erosion-prone creek banks or excessive water flow impede safe access, minor detours outside this corridor may be required to minimise environmental impacts and maintain safe and ALARP working conditions. Much of the area to be surveyed is open woodland; in these areas minimal line preparation work will be required for access by survey vehicles. Mature trees, trees with active</li> </ul>

<ul style="list-style-type: none"><li>• Where necessary, a mulcher or slasher will be used for preparing the seismic lines for access by survey vehicles. A mulcher simultaneously cut vegetation, mulch, and spread the mulch for minimal impact. Both a mulcher and slasher leave the vegetation rootstock intact, allowing rapid rehabilitation. Only a 5 m width within the notional 50 m seismic line corridor will be prepared. This enables the preparation vehicles to avoid, as much as is practicable, mature trees, trees with active hollows or nests, and obstacles such as termite mounds.</li><li>• In easily traversable terrain such as open woodland, the mulcher would be operated with the mulcher up, with the marks of the mulcher tracks sufficient for the surveyors and recording crew to follow.</li><li>• In the final ground truthing along the seismic line routes to identify significant trees, any riparian vegetation would also be recorded. Seismic vehicles may traverse these areas where the density of vegetation allows safe passage of vehicles with no line preparation. Vegetation slashing or mulching may be required for access but will follow the riparian vegetation decision tree shown in Figure 3.5—13. Where suitable watercourse crossing points are not possible, existing access tracks will be used. Small portable nodal geophones may also be used in riparian areas for data acquisition.</li><li>• Land and soil will be protected through the implementation of site-specific management plans described in Section 7 (see this section for Erosion and Sediment Control, Weed Management, Fire Management, Rehabilitation Management, Waste Management, Emergency Response, and Spill Management).</li><li>• Terrestrial habitats will be protected by first identifying them during on-ground assessments by an ecologist, and then by avoiding them within the 50 m seismic line corridors.</li><li>• No new groundwater bores are required. The water required to maintain existing tracks, to be used for dust suppression, or firefighting will be sourced from existing, registered water bore(s).</li><li>• The Activity will be of a limited duration, with vehicles and equipment being maintained per the original equipment manufacturer’s procedures and diesel use will be recorded and reported.</li></ul>	<p>hollows or nests selected for preservation, would be recorded, and flagged to ensure their protection during final ground truthing prior to line preparation.</p> <ul style="list-style-type: none"><li>• Where necessary, a mulcher or slasher will be used for preparing the seismic lines for access by survey vehicles. A mulcher simultaneously cut vegetation, mulch, and spread the mulch for minimal impact. Both a mulcher and slasher leave the vegetation rootstock intact, allowing rapid rehabilitation. Only a 5 m width within the notional 50 m seismic line corridor will be prepared. In instances where detours are required outside the 50 m corridor to avoid sensitive areas and environmental hazards, these detours will also be restricted to no more than 5 m of disturbance width. This enables the preparation vehicles to avoid, as much as is practicable, mature trees, trees with active hollows or nests, and obstacles such as termite mounds.</li><li>• In easily traversable terrain such as open woodland, the mulcher would be operated with the mulcher up, with the marks of the mulcher tracks sufficient for the surveyors and recording crew to follow.</li><li>• In the final ground truthing along the seismic line routes to identify significant trees, any riparian vegetation would also be recorded. Seismic vehicles may traverse these areas where the density of vegetation allows safe passage of vehicles with no line preparation. Vegetation slashing or mulching may be required for access but will follow the riparian vegetation decision tree shown in Figure 3.5—13. Where suitable watercourse crossing points are not possible, existing access tracks will be used. Small portable nodal geophones may also be used in riparian areas for data acquisition.</li><li>• Land and soil will be protected through the implementation of site-specific management plans described in Section 7 (see this section for Erosion and Sediment Control, Weed Management, Fire Management, Rehabilitation Management, Waste Management, Emergency Response, and Spill Management).</li><li>• Terrestrial habitats will be protected by first identifying them during on-ground assessments by an ecologist, and then by avoiding them within the 50 m seismic line corridors.</li></ul>
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<ul style="list-style-type: none"> <li>• The workforce required for the Activity will be primarily interstate, given the specialised nature of the Activity; however, the Interest Holder has strategies and targets in place for local hire.</li> <li>• Stakeholders have been engaged, and land access agreements will be in place with the affected parties.</li> <li>• An archaeological study undertaken in July 2023 (<b>Appendix 02</b>), has identified four significant sites in the Project Area. Seismic lines have been adjusted so that all four sites are avoided.</li> <li>• AAPA Authority Certificates have been granted, and the terms and conditions of the AAPA Authority Certificates are incorporated into project planning.</li> <li>• During the Activity, the health and safety of personnel will be protected by implementing the contractor’s safety protocols, which will be assessed to ensure conformance with the SMS. In addition, the environmental protection measures set out in this EMP will be implemented in accordance with the contractor’s environment protection protocols, which will be assessed to ensure conformance with the SMS.</li> </ul> <p>Based on the self-assessment, the Interest Holder has determined that the Activity is unlikely to have a significant impact on the environment, and therefore, it is not required to be referred to the NT EPA under the EP Act.</p>	<ul style="list-style-type: none"> <li>• No new groundwater bores are required. The water required to maintain existing tracks, to be used for dust suppression, or firefighting will be sourced from existing, registered water bore(s).</li> <li>• The Activity will be of a limited duration, with vehicles and equipment being maintained per the original equipment manufacturer’s procedures and diesel use will be recorded and reported.</li> <li>• The workforce required for the Activity will be primarily interstate, given the specialised nature of the Activity; however, the Interest Holder has strategies and targets in place for local hire.</li> <li>• Stakeholders have been engaged, and land access agreements will be in place with the affected parties.</li> <li>• An archaeological study undertaken in July 2023 (<b>Appendix 02</b>), has identified four significant sites in the Project Area. Seismic lines have been adjusted so that all four sites are avoided.</li> <li>• AAPA Authority Certificates have been granted, and the terms and conditions of the AAPA Authority Certificates are incorporated into project planning.</li> <li>• During the Activity, the health and safety of personnel will be protected by implementing the contractor’s safety protocols, which will be assessed to ensure conformance with the SMS. In addition, the environmental protection measures set out in this EMP will be implemented in accordance with the contractor’s environment protection protocols, which will be assessed to ensure conformance with the SMS.</li> </ul> <p>Based on the self-assessment, the Interest Holder has determined that the Activity is unlikely to have a significant impact on the environment, and therefore, it is not required to be referred to the NT EPA under the EP Act.</p>
<p><b><u>3.5.1.2 Site Selection and Planning</u></b></p> <p>The preliminary concept seismic line locations were based on borehole breakout data and fracture orientations from image logs. The preliminary selection process integrated data from the MCSAN 2013 Survey and possible future well locations. The location of the preliminary lines was refined during follow-up planning and design to address the controls and proactive measures outlined in this EMP. The development of controls in</p>	<p><b><u>3.5.1.2 Site Selection and Planning</u></b></p> <p>The preliminary concept seismic line locations were based on borehole breakout data and fracture orientations from image logs. The preliminary selection process integrated data from the MCSAN 2013 Survey and possible future well locations. The location of the preliminary lines was refined during follow-up planning and design to address the controls and proactive measures outlined in this EMP. The development of controls in this EMP were</p>

this EMP were informed by third-party desktop surveys and civil, ecological, and archaeological field surveys (refer to **Appendix 01**, **Appendix 02**, and **Section 4** Description of the Existing Environment). An example of how the preliminary lines have been adjusted to the proposed seismic lines is shown in **Figure 3.5—1**.

Clause A.3.1(a) of *the Code* requires that the planning, design, location, and construction of petroleum infrastructure must have regard to the considerations in the *LCG* and outlines items that specific considerations must be given. These specific considerations and how they are addressed is outlined in **Table 3.5—1**, noting there are no construction operations proposed with the Activity.

The proposed seismic and connection lines comply with AAPA Authority Certificates C2020/011 and C2019/043 (variation to C2014/053), by avoiding the Restricted Work Areas (RWA).

A working corridor of 50 m has been established for the seismic and connection lines (25 m either side of the line) to allow deviations to avoid, where possible:

- Mulching, as opposed to traversing.
- Areas of greater erosion concern (e.g., significant slope).
- Key environmental sensitivities (e.g., mature trees, trees with active hollows or nests).
- Obstacles (e.g., termite mounds).
- Cultural heritage sites (e.g., archaeological sites, AAPA restricted work areas).

**Figure 3.5—2** illustrates an indicative example of how the seismic vehicles can deviate from the seismic centreline to a route that avoids these items. **Figure 3.5—3** provides an overview of the seismic and connection lines, including an inset illustrating the working corridor applied to all lines. In the event the seismic convey cannot find a safe and ALARP route within the 50 m working corridor, they will back track to a line connection and rejoin the original line past the obstruction. Detailed views of the seismic lines, associated connection lines, access tracks, and the campsite can be found in **Figure 3.5—4**, **Figure 3.5—5**, and **Figure 3.5—6**. **Figure 3.5—7** provides detailed views of the central area in the eastern group of seismic lines, highlighting all connection lines and presenting two options for connection lines near the McArthur River gas pipeline. Further descriptions of these options are available in Section 3.5.1.4. Details on the

informed by third-party desktop surveys and civil, ecological, and archaeological field surveys (refer to **Appendix 01**, **Appendix 02**, and **Section 4** Description of the Existing Environment). An example of how the preliminary lines have been adjusted to the proposed seismic lines is shown in **Figure 3.5—1**.

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- Mulching, as opposed to traversing.
- Areas of greater erosion concern (e.g., significant slope).
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- Obstacles (e.g., termite mounds).
- Cultural heritage sites (e.g., archaeological sites, AAPA restricted work areas).

In instances where environmental hazards (e.g. excessive rainfall washing out creek banks) impede safe passage within the established 50 m working corridor, slight detours outside this corridor may be undertaken as required. Such deviations are necessary to avoid direct impacts to sensitive watercourse areas, minimise erosion risks on steep banks, reduce environmental disturbance, minimising vehicle traffic on the seismic lines and provide safe and ALARP working conditions for crew. Necessary detours will not increase the disturbance area of the seismic lines and will only be undertaken in instances where adhering to the defined corridor would increase environmental and operational risks.

**Figure 3.5—2** illustrates an indicative example of how the seismic vehicles can deviate from the seismic centreline to a route that avoids these items. **Figure 3.5—3** provides an overview of the seismic and connection lines, including an inset illustrating the working corridor applied to all lines. In the event the seismic convey cannot find a safe and ALARP route

<p>seismic and connection lines, including line lengths, coordinates, and disturbance areas, are provided in <b>Table 3.5—2</b>.</p>	<p>within the 50 m working corridor and no detours can be identified within immediate proximity of the established corridor, they will back track to a line connection and rejoin the original line past the obstruction. Detailed views of the seismic lines, associated connection lines, access tracks, and the campsite can be found in <b>Figure 3.5—4</b>, <b>Figure 3.5—5</b>, and <b>Figure 3.5—6</b>. <b>Figure 3.5—7</b> provides detailed views of the central area in the eastern group of seismic lines, highlighting all connection lines and presenting two options for connection lines near the McArthur River gas pipeline. Further descriptions of these options are available in Section 3.5.1.4. Details on the seismic and connection lines, including line lengths, coordinates, and disturbance areas, are provided in <b>Table 3.5—2</b>.</p>
<p><b>3.5.2 Seismic Line Preparation</b></p> <p>As noted in <b>Section 3.5.1.2</b>, on-site assessments have identified that vegetation within the Project Area is predominantly sparse woodland, is already disturbed or is riparian (up to 85%). Therefore, traversing without line preparation will be feasible for much of the seismic and connection line length. Ground truthing will occur along the seismic and connection line routes to identify significant trees and riparian vegetation.</p> <p>A slasher and a mulcher will be used for the Activity where necessary. Both are rotary machines however; slashers will only be used for the ‘mowing’ of grass. A mulcher will be utilised for mowing as well as any other preparation required (e.g. tree removal). They both will prepare a width of 5 m within a 50 m seismic line working corridor.</p> <p>A slasher or mulcher will be necessary in some areas to provide safe access and enable sufficient ground contact for the seismic vibro-source and the geophone nodes. <b>Figure 3.5—8</b> shows an example of both rotary machines.</p> <p>In particular the main confluence of Tanumbirini and Snake Creek (refer <b>Section 4.1.7</b>) was demonstrated to be highly traversable in desktop assessment (refer <b>Section 4.2.2</b>) and during ground-truthing. As such, a no-mulching boundary has been applied to the braided/confluence of Snake and Tanumbirini Creeks. Similarly, a 50 m buffer around creeks identified during field scouting located in the tributaries immediately surrounding the main braided/confluence of Snake and Tanumbirini Creeks. This boundary can be seen in <b>Figure 3.5—9</b>. Slashing may still be required within these boundaries for the safety of personnel and the convoy.</p> <p>Where mulching is necessary, the mulcher simultaneously cuts, mulches, and spreads the mulch on the seismic line for minimal impact and rapid rehabilitation.</p>	<p><b>3.5.2 Seismic Line Preparation</b></p> <p>As noted in <b>Section 3.5.1.2</b>, on-site assessments have identified that vegetation within the Project Area is predominantly sparse woodland, is already disturbed or is riparian (up to 85%). Therefore, traversing without line preparation will be feasible for much of the seismic and connection line length. Ground truthing will occur along the seismic and connection line routes to identify significant trees and riparian vegetation.</p> <p>A slasher and a mulcher will be used for the Activity where necessary. Both are rotary machines however; slashers will only be used for the ‘mowing’ of grass. A mulcher will be utilised for mowing as well as any other preparation required (e.g. tree removal). They both will prepare a width of 5 m within a 50 m seismic line working corridor.</p> <p>A slasher or mulcher will be necessary in some areas to provide safe access and enable sufficient ground contact for the seismic vibro-source and the geophone nodes. <b>Figure 3.5—8</b> shows an example of both rotary machines.</p> <p>In particular the main confluence of Tanumbirini and Snake Creek (refer <b>Section 4.1.7</b>) was demonstrated to be highly traversable in desktop assessment (refer <b>Section 4.2.2</b>) and during ground-truthing. As such, a no-mulching boundary has been applied to the braided/confluence of Snake and Tanumbirini Creeks. Similarly, a 50 m buffer around creeks identified during field scouting located in the tributaries immediately surrounding the main braided/confluence of Snake and Tanumbirini Creeks. This boundary can be seen in <b>Figure 3.5—9</b>. Slashing may still be required within these boundaries for the safety of personnel and the convoy.</p> <p>Where mulching is necessary, the mulcher simultaneously cuts, mulches, and spreads the mulch on the seismic line for minimal impact and rapid rehabilitation.</p>



Both the mulcher and slasher preparation widths are 5 m, the soil is not disturbed, and vegetation rootstock is left intact. The mulcher will operate with the mulcher up within the working corridor when mulching is not required. GPS / navigation devices will notify personnel of vehicle exclusion zones like the working corridor boundaries or any other 'no-go' zones like the no-mulching area.

The nominal 50 m seismic line corridors allow deviation around potential obstacles and key environmental sensitivities (e.g., mature trees, trees with active hollows or nests) where practicable and cultural sites will be avoided. **Figure 3.5—10** shows an example of a weaving seismic line deviating around vegetation. Rotary vehicles like mulchers and slashers will often just be used to 'mow' grass (refer to **Figure 3.5—11**) as the working corridors are highly traversable (up to 85%). Areas like Tanumbirini Creek (refer to seismic lines MCSAN23-[06-12]A and **Figure 3.5—2**) will not require mulching and as such, only a slasher will be used in this area

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