



PILBARA IRON ORE AND INFRASTRUCTURE PROJECT

**Mulga and
Other Flora and Communities
Management Plan**

6 November 2009

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

Fortescue Metals Group Limited (Fortescue) has commenced operation of the Pilbara Iron Ore and Infrastructure Project (the Project), which consists of several iron ore mines and associated rail and port infrastructure in the Pilbara region of Western Australia (Figure 1). The primary environmental approvals for the project have been obtained in four stages:

- Stage A consisting of an iron ore export facility at Port Hedland and a north-south railway from the central Pilbara to Port Hedland (approved under Ministerial Statement 690);
- Stage B consisting of two iron ore mines in the Eastern Pilbara (Christmas Creek and Mindy Mindy) and an east-west spur rail line connecting to the Stage A railway (approved under Ministerial Statement 707);
- Cloudbreak iron ore mine west of the Christmas Creek area (approved under Ministerial Statement 721 and Commonwealth Assessment EPBC 2005/2205); and
- Port facility upgrade of the third berth at Anderson Point, Port Hedland: Dredging and Wharf Construction (approved under Ministerial Statement 771).

The Cloudbreak and Christmas Creek mine sites are located on the southern slopes of the Chichester Range; collectively the two mine sites are referred to as the Chichester Operations.

During the initial stages of operation, mining will occur in the Cloudbreak and Christmas Creek areas, with ore hauled by truck from Christmas Creek to the ore processing facility at Cloudbreak. Ore from Cloudbreak and Christmas Creek is then transported by train along the approved north-south (Stage A) and east-west (Stage B) railways to Port Hedland.

Proposed extensions of the rail line to the south and to the east will be considered in future expansions.

The existing infrastructure at Fortescue's Herb Elliott Port provides for train unloading, stacking and reclaiming and ship loading of iron ore via a conveyor system. Expansion of the port facility to include an additional



fourth and fifth berth and increased reclaiming capacity is proposed to handle increased ore production from the Chichester Operations.

1.2 PURPOSE

The purpose of this Plan is to outline the existing available information on the significant flora and vegetation within the Chichester Operations and infrastructure corridors and to minimise the potential environmental impacts of Fortescue's mining operations.

The Plan is developed to meet the requirements of Condition 6 (Mulga and Other Flora and Communities) of Ministerial Statements 707 and 721 (excluding the proposed Mindy Mindy mine site) as described in Table 1.

Table 1: Flora and Vegetation Management Plan Requirements of Ministerial Statements 707 and 721

| Statement 707 Requirement | Statement 721 Requirement | Requirement or Issue | Location in Plan (Section) |
|---------------------------|---------------------------|---|--|
| 6-1-1 | 6-1-2 | Results of further targeted flora and vegetation surveys where surveys have not been completed prior to ground-disturbing activities to provide further information on the conservation and baseline values status of each of the species and/or communities within the project area. | 6; 7.1 |
| 6-1-2 | 6-1-1 | Ongoing management, monitoring and reporting of impacts on vegetation communities, including DRF and Priority Flora species, Mulga restricted plant communities, within project area and strategies for minimisation or mitigation of impacts. | 7.1 |
| 6-1-3 | 6-1-4 | Any regeneration or revegetation strategies which are required for species and/or communities referred to in item 1 (of Statement 721), including completion criteria to be met following the survey for species and/or communities impacted by the project. | 7.5 Life of Mine Closure Plan as required through Condition 12 (of Statement 721); in consultation with the DEC and Department Mines and Petroleum (DMP). |



| Statement 707 Requirement | Statement 721 Requirement | Requirement or Issue | Location in Plan (Section) |
|---------------------------|---------------------------|---|---|
| - | 6-1-3 | The development of criteria for establishing impact on vegetation communities, including Mulga. | 7.4 |
| 6-1-4 | 6-1-5 | Management or mitigation actions required to address any impacts on vegetation communities or failure to achieve the completion criteria. | 7.4 This will also be addressed through the Life of Mine Closure Plan. |
| 6-1-5 | 6-1-6 | Further investigations into the regeneration and seed ecology of affected species or communities in order to determine appropriate regeneration methodologies, if completion criteria are not being achieved. | 7.5 This will also be addressed through the Life of Mine Closure Plan. |

1.3 SCOPE

This plan applies to Fortescue's Chichester operations area, which includes the following areas:

- Cloudbreak mine site;
- Access road from Cloudbreak east to the Marble Bar Road; and
- Christmas Creek mine site.

This plan will be revised to include other mine sites as they are developed in later stages of the Project.

1.4 POTENTIAL ENVIRONMENTAL IMPACTS

The key potential impacts to Mulga and other flora and communities from this project, as summarised in the Cloudbreak and Stage B Public Environmental Reviews (Environ 2005a, 2005b) are presented in Table 2.



Table 2: Potential Impacts to Flora and Vegetation from the Project

| Potential Impact | Details | Management |
|-------------------------------------|---|--|
| Vegetation clearing | It is estimated that 10,123 ha will be cleared for the Christmas Creek mine and up to 5,500 ha will be cleared for the Cloudbreak mine. Approximately 1,600 ha are likely to be cleared for the railway. | Avoidance of DRF, Priority Flora and significant vegetation through review of design plans following botanical surveys (Section 7.1) Obtaining a Ground Disturbance Permit (GDP) as part of <i>Fortescue's internal assessment procedure</i> (100-PR-EN-0004) prior to ground disturbance activities. |
| Disruption to surface hydrology | Mulga groves in the gently sloping alluvial plains of the area may be dependent on sheet water flows. Rail and road formations, mine pits and other earthworks have the potential to disrupt sheet flow patterns in Mulga grove/intergrove areas. | Minimising and management of surface water disruptions as per the <i>Rail Surface Water Management Plan</i> (R-PL-EN-0011) and <i>Chichester Operations Surface Water Management Plan</i> (45-PL-EN-0015). |
| Erosion | Erosion may be a problem following clearing of vegetation in the susceptible clays and heavier soils of the Mulga communities within the Fortescue Valley. | Progressive rehabilitation as outlined in the Rehabilitation and Revegetation Management Plan and related documentation. |
| Introduction and/or spread of weeds | Earthworks, topsoil and overburden transportation, vehicle movement and other factors have the potential to introduce and spread weeds within and around the project area. | <i>Weed Hygiene and Management Plan</i> (45-PL-EN-0013). |
| Fire | Native vegetation is generally adapted to fire, but changes in frequencies may pose a threat to species composition and vegetation structure. Further, there is evidence that Mulga communities may be killed by hot fires – particularly if in combination with other pressures. | <i>Fire Management Plan</i> (100-PL-SA-0003). |



| Potential Impact | Details | Management |
|---------------------------------|--|--|
| Dust | Dust can smother and kill vegetation. Whilst background levels of dust are high, further dust may come from: <ul style="list-style-type: none">• construction and mining• crushing and sizing• transport; and• cleared areas. | <i>Chichester Operations Dust Management Plan (CB-PL-EN-0009).</i> |
| Groundwater drawdown / mounding | Drawdown or mounding of groundwater as a result of mine dewatering or groundwater injection has the potential to impact phreatophytic and other species which occur in the project area. | <i>Chichester Operations Groundwater and Bore Management Plan (45-PL-EN-0005) and Fortescue Marshes Management Plan (45-PL-EN-0009).</i> |

1.5 OTHER RELEVANT DOCUMENTS

The following Fortescue documents should be read in conjunction with this plan:

- *Rail Surface Water Management Plan (R-PL-EN-0011);*
- *Chichester Operations Surface Water Management Plan (45-PL-EN-0015);*
- *Weed Hygiene and Management Plan (45-PL-EN-0013);*
- *Fire Management Plan (100-PL-SA-0003);*
- *Chichester Operations Dust Management Plan (CB-PL-EN-0009);*
- *Chichester Operations Groundwater and Bore Management Plan (45-PL-EN-0005);*
- *Fortescue Marshes Management Plan (45-PL-EN-0009);* and
- *Ground Disturbance Permits Procedure (100-PR-EN-0004, formerly E-EN-PP-0020).*



2. STAKEHOLDER CONSULTATION

Fortescue has undertaken an extensive stakeholder consultation program whereby landowners, regulators and other relevant parties have been consulted with regard to investigation and design of the Project (see Section 7 in Environ 2005a, and Section 6 in Environ 2005b).

Fortescue applies the principles of its *Stakeholder Consultation Strategy* (100-PH-EN-0003) for the development and implementation of stakeholder engagement during management plan development and implementation.

The DEC was consulted regarding the final content of the plan that was originally approved.



3. APPLICABLE LEGISLATION

There is a range of legislation that relates to vegetation protection and management in Western Australia (Table 3). The most relevant in this case are the *Wildlife Conservation Act 1950*, and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which provides statutory protection to flora and threatened ecological communities. The *Environmental Protection Act 1986* (and associated Native Vegetation Clearing Regulations), which prohibits environmental harm and regulates the clearing of native vegetation.

Table 3: Commonwealth and State Legislation Relating to Flora Management

| Legislation | Application |
|--|---|
| <i>Environment Protection and Biodiversity Conservation Act 1999</i> | Protection on environmental matters of national significance. |
| <i>Environmental Protection Act 1986</i> | Prevention, control and abatement of pollution and conservation protection and enhancement of environment. |
| <i>Soil and Land Conservation Act 1945</i> | Deals with the conservation of soil and land resources and with the mitigation of the effects of erosion. |
| <i>Wildlife Conservation Act 1950</i> | Provides for the conservation and protection of wildlife (flora and fauna). Special provisions and schedules cover protection and management of gazetted rare flora and fauna. |
| <i>Rights in Water and Irrigation Act 1914</i> | Relates to rights in water resources, to make provision for the regulation, management, use and protection of water resources, to provide for irrigation schemes, and for related purposes. |

Rare flora species are declared as such under Section 23F of the *Wildlife Conservation Act 1950*. The Act makes it an offence to “take” (which includes to gather, pluck cut, pull up, destroy, dig up, remove or injure) Declared Rare Flora (DRF) without Ministerial approval.

The DEC has also established three categories of Priority Flora defined to cover poorly known species. The categories are arranged to give an indication of the priority for undertaking further surveys based on the number of known sites, and the degree of threat to those populations. A fourth category of Priority Flora is included for those species that have been



adequately surveyed and are considered to be rare but not currently threatened. Special consideration should be given to the management of these species.

Table A1 in Appendix A presents the definitions of DRF under the *Wildlife Conservation Act 1950* and the four Priority Flora categories as used by the DEC.

Threats of extinction of species are also recognised at a Commonwealth Government level and are categorised according to the EPBC Act. Categories of threatened species are summarised in Table A2, Appendix A.

Communities may be described as 'Threatened Ecological Communities' (TEC) by both the State and Commonwealth governments. This will occur if they have been considered by the Western Australian Threatened Ecological Communities Scientific Advisory Committee and found to be Presumed Totally Destroyed (PD), Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). Selected plant communities have also been listed as 'Threatened Ecological Communities' under the EPBC Act. The TECs identified at the national level are listed on the DEWHA website located at:

<http://environment.gov.au/biodiversity/threatened/communities.html>



4. ROLES AND RESPONSIBILITY

Table 4 provides provisional roles and responsibilities of the personnel responsible for the *Mulga and Other Flora and Communities Management Plan*.

Table 4: Roles and Responsibilities

| Position | Responsibility |
|---|--|
| Group Manager, Environment | Implementation of this Plan. Ensure environmental management measures are appropriately resourced and funded. Periodic audits and review of the Plan. |
| Manager, Environment Operations | Ensure that the impact of Fortescue's operations on significant flora, and significant vegetation is minimised. Ensure this plan is being adhered to by all staff and contractors. Participate in compliance audits and inspections. Report results of compliance audits and inspections to the Group Manager, Environment. |
| Superintendent, Environment Operations | Botanical assistance and advice to field operators regarding significant flora and vegetation. Ensure all staff are aware of their obligations in relation to this plan. Deliver flora and vegetation education and awareness training to field operators. To provide technical support and advice to site staff. |
| Officer, Environment Administration | Administers the <i>Ground Disturbance Permit Procedure</i> (100-PR-EN-0004, formerly E-EN-PP-0020). Arranges for biological surveys as required. |
| Coordinator, GIS | Administers Fortescue's spatial databases containing information on Mulga and other flora and communities. |
| All Fortescue personnel and contractors | Minimise impacts on native flora from the construction and operation of the project. Report all known breaches of the management strategies and procedures to their Manager. |



5. FLORA AND VEGETATION COMMUNITIES

5.1 DECLARED RARE FLORA

No DRF has been recorded during biological survey work conducted along the Stage B rail or in the Chichester Operations area. However, vegetation and flora surveys have recorded a number of Priority Flora within the rail corridor and at the Chichester Operations areas. Known Priority Flora species and locations are recorded in the Priority Flora Register and are also stored in the central Fortescue GIS database. Known Priority Flora locations across the Chichester Operations are also presented in Figure 2.

No threatened flora as listed pursuant to the EPBC Act has been recorded within the Chichester Operations area.

5.2 THREATENED ECOLOGICAL COMMUNITIES

Vegetation surveys undertaken across the extent of Fortescue's port, rail and mine project areas have not identified any TECs.

5.3 MULGA COMMUNITIES

Mulga-dominated vegetation communities in the Chichester Operations area occur generally over the Jamindie and Cowra land systems on the southern foot slopes of the Fortescue Ranges north of the Fortescue Marshes. Mulga vegetation across the Chichester Operations area is presented in Figure 2.

Mulga-dominated vegetation in the Chichester Operations area are generally considered to form part of the northern extent of Mulga vegetation range in Western Australia, although it should be noted that approximately 121,145 ha of land systems containing Mulga communities exist north of Fortescue's Chichester Operations.

Whilst Mulga vegetation types are not considered to be TECs in the Chichester Operations area, the DEC and Fortescue nonetheless considers them as significant vegetation types as they:

- Are susceptible to disturbance from fire, grazing, weeds and development;
- Exhibit a high degree of morphological variability between populations;
- Appear to play an important role in water and nutrient capture and are important to ecosystem function; and



- May support or provide refuge to restricted flora and fauna species.

5.4 PHREATOPHYTIC VEGETATION

Vegetation complexes in and around creek lines in the Chichester Operations area support phreatophytic (directly dependent on groundwater) species such as River Red Gum (*Eucalyptus camaldulensis*), Cadjeput (*Melaleuca argentea*) and Coolibah (*E. victrix*).



6. ADDITIONAL INFORMATION

6.1 ADDITIONAL SURVEY WORK

In response to Condition 6-1 of Ministerial Statement 707 and Ministerial Statement 721, where previous surveys have been inadequate, additional studies have been completed.

Numerous vegetation surveys have been completed in previously unsurveyed or insufficiently surveyed areas including rail corridor borrow pits, mine pits, access roads and infrastructure areas of the Chichester Operations.

The outcome of these additional surveys has been incorporated into this Plan and included within the internal Fortescue GIS database. As outlined in Section 7.1, all areas have been surveyed for DRF, Priority Flora and significant vegetation prior to disturbance activities.

A summary of the results of these surveys is provided in Fortescue's Annual Environmental Reports.

From the extensive amount of data and information gathered from ground-truthing surveys and additional studies in the area, flora consultants have advised Fortescue that no DRF or TECs are likely to be present in the Chichester Operations area. Thus, Fortescue considers the risk of future disturbance to DRF and TECs to be low. However, an internal review of all proposed disturbance areas is undertaken prior to any ground disturbance, as discussed below.

6.2 GROUND DISTURBANCE PERMIT (GDP) SYSTEM

Fortescue has introduced a procedure where internal review and approval of all proposed vegetation clearing and ground disturbance activities is required prior to the commencement of works. This procedure is used by the person/s assessing the ground disturbing or vegetation clearing works across all Fortescue sites and activity areas. Works can be undertaken as proposed once the Ground Disturbance Permit (GDP) application is approved and a GDP is sent to the applicant.

Additionally, Fortescue will consult with consultants to determine if there is the need for further vegetation assessments. A desktop assessment is then undertaken to determine the likely presence of DRF, Priority Flora and Threatened or Priority Ecological Communities, and to determine the level



risk associated with the proposal clearing. Following this assessment, the area may undergo ground truthing surveys for the presence of DRF, Priority Flora and Threatened or Priority Ecological Communities.

Fortescue considers this approach to be environmentally acceptable in fulfilling Condition 6 of Ministerial Statements 707 and 721.

Figure 3 presents a flowchart documenting the process to be followed to determine the necessity of a vegetation survey prior to the approval of a GDP application. Management strategies for this process are detailed in Section 7.1.

Priority Flora and Mulga vegetation locations across the Chichester Operations area are presented in Figure 2. Records of Priority Flora locations recorded in previous and ongoing surveys are also provided in the Fortescue's spatial database.



7. ENVIRONMENTAL MANAGEMENT

The general approach to management of Mulga and other flora and communities has been detailed below. Each objective has had management actions developed to ensure the objective is achieved. Each of the management objectives follow the structure outlined below:

| Item | Content |
|-------------------------------|--|
| Objective | What is intended to be achieved? |
| Management Actions | Tasks that will be undertaken to meet the objective. List of the relevant procedures. |
| Performance Indicators | Qualitative or quantitative measures to determine if the objective is met. |
| Monitoring | Details of measurement of performance indicators. |
| Reporting | Nature, timing and responsibility for reporting results. |
| Corrective Action | Action to be taken if monitoring indicates objective is not being met. |
| Term | Active term of management plan. |
| Responsibility | Delegation/nomination of responsibilities for overseeing management plan operation. |



7.1 FLORA AND VEGETATION SURVEYS

| | |
|--------------------------------------|--|
| <p>Objective/Target</p> | <p>Minimise impacts to conservation significant vegetation and flora within the Chichester Operations area.</p> <p>Ensure occurrences of DRF, Priority Flora and conservation significant vegetation within the Chichester Operations area are documented and mitigation measures to reduce potential impacts are implemented.</p> |
| <p>Management Actions</p> | <p>Where required, standard methodologies for flora and vegetation mapping and surveys across the Chichester Operations shall be conducted in general consistency with the EPA's guidelines for flora surveys as outlined in <i>Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia</i> (EPA, 2004) and <i>Terrestrial Biological Surveys as an Element of Biodiversity Protection Position Statement No. 3</i> (EPA, 2002).</p> <p>All planned vegetation clearing is to be assessed in accordance with Fortescue's <i>Ground Disturbance Permit Procedure</i> (100-PR-EN-0004, formerly E-EN-PP-0020) to ensure Fortescue's impacts on the environment, heritage values and land owners are managed appropriately and any management strategies for conservation significant flora and vegetation are identified.</p> <p>Any occurrences of DRF or Priority Flora or conservation significant vegetation are to be mapped and spatial data of locations and occurrences maintained in Fortescue's internal GIS system.</p> <p>All new locations of DRF or TECs are to be reported to the DEC as soon as practicable.</p> |
| <p>Performance Indicators</p> | <p>Significant flora and vegetation information and mitigation strategies for the Chichester Operations are identified, documented and available for reference prior to ground disturbance activities.</p> |
| <p>Monitoring</p> | <p>Ground disturbance permit records shall be maintained for review and audit purposes.</p> <p>Actual vegetation clearing data is recorded in the Fortescue GIS and GDP systems.</p> |
| <p>Reporting</p> | <p>Summaries of vegetation disturbance and flora surveys are to be presented in Annual Environmental Reports.</p> <p>Incidents of clearing outside of approved areas and the results of incident investigations will also be reported in Annual Environmental Reports.</p> |



| | |
|--------------------------|---|
| Corrective Action | <p>Any clearing that occurs without an approved GDP shall be considered an incident and reported and investigated as per the <i>Accident – Incident Reporting Procedure</i> (100-PR-SA-0011). The incidents will be investigated to determine the cause, and a review of management measures undertaken to prevent re-occurrence as required.</p> <p>Clearing outside of approved areas shall be reported to the Group Manager, Environment and remedial actions developed where practicable (e.g. rehabilitation).</p> |
| Term | Life of the Project |
| Responsibility | <p>Manager, Environment Operations</p> <p>Ensure that the procedures are communicated and implemented in the field.</p> <p>Superintendent, Environment Operations</p> <p>Provide training, supply equipment and ensure that contractors adhere to the procedures.</p> <p>Fortescue staff and contractors</p> <p>Report incidents and implement controls as required by this document.</p> <p>Officer, Environment Administration</p> <p>Ensure that the GDP procedure is properly implemented and ground-truthing surveys are undertaken where necessary.</p> <p>Coordinator, GIS</p> <p>Ensure that Fortescue’s GIS databases are kept up to date with respect to DRF and Priority Flora locations identified during ground-truthing surveys.</p> |



7.2 THREATENED FLORA PROTECTION

| | |
|-------------------------------|--|
| Objective/Target | <p>To minimise impacts to DRF and Priority Flora as a result of Fortescue's operations.</p> <p>Route and mining plan configured to avoid any Priority Flora found in surveys as far as practicable.</p> |
| Management Actions | <p>Relevant personnel will be informed of their responsibilities regarding DRF and Priority Flora under the <i>Wildlife Conservation Act 1950</i> and known no-go areas will be indicated.</p> <p>Results of survey data shall be reviewed against project design to prevent the clearing of any DRF or Priority Flora where practicable.</p> <p>Where the disturbance cannot be avoided, any requisite permits from the DEC shall be sought. No disturbance of DRF is to occur until a permit has been approved by the Minister for the Environment.</p> <p>Road and other access alignments and borrow pit areas are to be constructed to avoid DRF and Priority Flora as far as practicable.</p> <p>All DRF locations are to be demarcated on the ground with appropriate fencing, signage and flagging.</p> <p>Where clearing of DRF and Priority Flora cannot be avoided:</p> <ul style="list-style-type: none">• Assess the local/regional conservation significance of the species prior to clearing.• Consult with the DEC regarding the proposed clearing.• Translocation of individuals to nearby similar vegetation associations will be attempted if practicable, dependent on research advice from consultant botanists and the DEC.• Seed and other propagules of DRF and/or Priority Flora planned for clearing will be collected and used for revegetation where practicable. |
| Performance Indicators | <p>Monitoring of the abundance and distribution of DRF and Priority Flora species identified, to occur within the Chichester Operations area.</p> |
| Monitoring | <p>DRF and Priority Flora located within active mining and operations areas are to be monitored annually by Site Environmental Team, to assess presence/absence, plant health and numbers.</p> <p>Checking exclusion fencing/flagging quarterly when mine operations occur in nearby areas.</p> <p>Monitoring of translocation, seed collection and other revegetation activities regarding DRF and Priority Flora will be undertaken according to the measures indicated in the Life of Mine Closure Plan.</p> |



| | |
|--------------------------|--|
| Reporting | <p>Summaries of DRF and Priority Flora surveys and management actions employed to minimise impacts will be provided in Annual Environmental Reports.</p> <p>Incidents of unauthorised disturbance of DRF and the results of incident investigations will be provided to the DEC.</p> |
| Corrective Action | <p>Any unauthorised clearing of DRF or Priority Flora shall be considered an incident and reported and investigated as per the <i>Accident – Incident Reporting Procedure</i> (100-PR-SA-0011). The causes of the incident will be determined, and management procedures modified and measures taken, to prevent further occurrences as required.</p> |
| Term | Life of the Project |
| Responsibility | <p>Manager, Environment Operations</p> <p>Ensure that the procedures are communicated and implemented in the field.</p> <p>General Manager, Mine</p> <p>Ensure construction activities and operations are undertaken in compliance with this Plan.</p> <p>Superintendent, Environment Operations</p> <p>Provide training, supply equipment and ensure that contractors adhere to the procedures.</p> <p>Fortescue staff and contractors</p> <p>Report incidents and implement controls as required by this document.</p> |



7.3 MULGA AND SIGNIFICANT VEGETATION COMMUNITIES

| | |
|----------------------------------|--|
| <p>Objective/Target</p> | <p>To minimise impacts to the condition and regional conservation status of Mulga and other significant communities within the Chichester Operations area.</p> <p>Ongoing management, monitoring and reporting of impacts on restricted Mulga plant communities within the Chichester Operations area and strategies for minimisation or mitigation of impacts.</p> |
| <p>Management Actions</p> | <p>All personnel will be informed of their responsibilities regarding Mulga communities, including the avoidance of potential impacts as described in this plan.</p> <p>Clearing of Mulga vegetation shall be minimised as far as practicable and approved through Fortescue’s internal <i>Ground Disturbance Permit Procedure</i> (100-PR-EN-0004, formerly E-EN-PP-0020).</p> <p>Implement measures stemming from research and trial programs to mitigate effects of altered drainage regime, including:</p> <ul style="list-style-type: none"> • Rock armouring • Culverts • Diversion drains • Other measures as appropriate • Action specifications detailed in the <i>Chichester Operations Surface Water Management Plan</i> (45-PL-EN-0015) <p>As per condition 12-5 of Ministerial Statement 707, Fortescue shall construct the railway having regard for this Management Plan.</p> <p>As per condition 12-6 of Ministerial Statement 707, Fortescue shall not disturb Mulga vegetation for the sole purpose of borrow pits.</p> <p>Ensure appropriate measures are undertaken in accordance with relevant Management Plans and procedures regarding:</p> <ul style="list-style-type: none"> • Erosion • Weeds • Fire • Dust • Groundwater drawdown or mounding <p>Following development of impact assessment methodologies, conduct monitoring of Mulga vegetation to assess impacts arising from Fortescue’s operations.</p> <p>For all water transfer pipelines, design corridor to minimise impact on surface water movement in Mulga woodlands so that significant drainage shadows are avoided.</p> |



| | |
|-------------------------------|---|
| Performance Indicators | The results of monitoring and assessment of the condition and status of Mulga restricted plant communities within the Chichester Operations area. |
| Monitoring | Annually review the extent of impact of Fortescue's operations and assess the significance of the impact on Mulga vegetation. |
| Reporting | Summaries of performance against management actions are to be provided in Annual Environmental Reports. Extent of Mulga vegetation clearing is to be provided in Annual Environmental Report. Incidents of unauthorised disturbance to Mulga vegetation and the results of incident investigations will be reported in Annual Environmental Reports. |
| Corrective Action | Any unauthorised clearing of Mulga vegetation shall be considered an incident and reported and investigated as per the <i>Accident – Incident Reporting Procedure</i> (100-PR-SA-0011). Causes of incidents will be determined and management procedures will be modified, and measures taken to prevent re-occurrences as required. Rehabilitation of unauthorised clearing shall be as directed by this Plan and in consultation with the Group Manager, Environment. |
| Term | Life of the Project |
| Responsibility | Manager, Environment Operations Ensure that the procedures are communicated and implemented in the field. General Manager, Mine Ensure construction activities and operations are undertaken in compliance with this Plan. Superintendent, Environment Operations Provide training, supply equipment and ensure that contractors adhere to the procedures. Fortescue staff and contractors Report incidents and implement controls as required by this document. |



7.4 DEVELOPMENT OF IMPACT ASSESSMENT CRITERIA FOR MULGA AND OTHER SIGNIFICANT VEGETATION COMMUNITIES

| | |
|-------------------------------|---|
| Objective/Target | <p>To develop criteria to establish the impact on vegetation communities in the Chichester Operations area, including Mulga communities.</p> <p>Impact criteria developed and included in management planning documentation for vegetation within the Chichester Operations area.</p> |
| Management Actions | <p>Implement and maintain impact assessment criteria and monitoring methodology to determine the impact of Fortescue's operations on surrounding significant vegetation.</p> <p>Ongoing assessment of impacts shall consider the following criteria:</p> <ul style="list-style-type: none">• Vegetation Structure• Vegetation Composition• Vegetation health/condition• Stress indicators such as vigour, level of leaf fall or discolouration, dieback, disease/insect attack, or mortality rates• Clearing boundaries• Changes in groundwater levels• Level of dust smothering vegetation• Other indicators as appropriate. <p>As per the <i>Chichester Operations Groundwater and Bore Management Plan (45-PL-EN-0005)</i> use hyperspectral aerial photography to map vegetation condition, water loss and dust deposition as a baseline tool and for ongoing annual monitoring.</p> <p>In addition to the vegetation monitoring outlined in the <i>Chichester Operations Groundwater and Bore Management Plan (45-PL-EN-0005)</i>, monitor for the potential impact that groundwater drawdown may have on phreatophytic eucalypts, including <i>Eucalyptus camaldulensis</i> and <i>E. victrix</i>. Where impacts are detected, and the areas are not planned for mining within the next two years, take remedial action to supplement the source of groundwater.</p> |
| Performance Indicators | <p>Development and implementation of assessment criteria.</p> |
| Monitoring | <p>The impact assessment criteria will be reviewed annually and amended as required.</p> |



| | |
|--------------------------|--|
| Reporting | <p>Summaries of performance against management actions are to be provided in Annual Environmental Reports.</p> <p>Revisions of impact assessment criteria will be provided to the Group Manager, Environment for comment prior to formal adoption within this Plan.</p> |
| Corrective Action | <p>If impact assessment criteria are not developed within the appropriate timeframe, then reasons for the delay will be investigated and action will be taken to develop the criteria as soon as practicable.</p> |
| Term | <p>Life of the Project</p> |
| Responsibility | <p>Manager, Environment Operations</p> <p>Ensure that the procedures are communicated and implemented in the field.</p> <p>General Manager, Mine</p> <p>Ensure construction activities and operations are undertaken in compliance with this Plan.</p> <p>Superintendent, Environment Operations</p> <p>Provide training, supply equipment and ensure that contractors adhere to the procedures.</p> <p>Fortescue staff and contractors</p> <p>Report incidents and implement controls as required by this document.</p> |



7.5 FURTHER INVESTIGATIONS

| | |
|--------------------------------------|---|
| <p>Objective/Target</p> | <p>To maintain a current understanding of the ecology and restoration methodologies of vegetation and flora impacted by Fortescue's operations to ensure that rehabilitation practices are sound and in line with standard industry practice.</p> <p>Commence investigations into the regeneration and seed ecology of affected species or communities in order to determine appropriate regeneration methodologies, if completion criteria are not being achieved within agreed timelines.</p> <p>Biannual review of mine rehabilitation processes based on research results during rehabilitation research program.</p> |
| <p>Management Actions</p> | <p>Implement targeted studies to assess:</p> <ul style="list-style-type: none"> • Regeneration methods; • Seed ecology; and • Other studies as required (e.g. threatened flora translocation, Mulga ecology, phreatophytic vegetation response to groundwater variation). <p>Develop research projects and strategies to investigate key areas identified. Engage research institutions, consultants and personnel, as required, to carry out the research.</p> <p>Ensure research results are disseminated to relevant personnel throughout Fortescue and incorporated into all relevant management plans and procedures.</p> |
| <p>Performance Indicators</p> | <p>The establishment of a rehabilitation research program.</p> <p>Results of research incorporated into relevant management plans and procedures.</p> |
| <p>Monitoring</p> | <p>Research organisations are to provide bi-annual (or more frequent) reports outlining the progress of project to date, preliminary results and findings and upcoming works.</p> <p>The Group Manager, Environment will ensure that all relevant study findings are incorporated into relevant Management Plans.</p> |
| <p>Reporting</p> | <p>Research program results, targets, recommendations and summaries of methodologies will be reported in Annual Environmental Reports.</p> |
| <p>Corrective Action</p> | <p>Reasons for non-compliance with the actions and any failure to meet the performance indicators will be investigated and a review of the actions, monitoring and reporting procedures will be undertaken.</p> <p>Recommendations of the reports will be incorporated into updated Management Plans.</p> |



| | |
|-----------------------|--|
| Term | For the life of the Project |
| Responsibility | <p>Manager, Environment Operations</p> <p>Ensure that the procedures are communicated and implemented in the field.</p> <p>General Manager, Mine</p> <p>Ensure construction activities and operations are undertaken in compliance with this Plan.</p> <p>Superintendent, Environment Operations</p> <p>Provide training, supply equipment and ensure that contractors adhere to the procedures.</p> <p>Fortescue staff and contractors</p> <p>Report incidents and implement controls as required by this document.</p> |



8. AUDITS AND INSPECTIONS

Auditing of Fortescue's performance against its environmental compliance obligations is achieved through the conduct of regular internal audits.

Fortescue will conduct compliance audits at least annually. Audit reports will describe the status of compliance with environmental obligations at the time of the audit and identify areas of non-conformance and non-compliance and assign corrective actions to remedy and non-conformance and non-compliance issues.



9. REVIEW

It is important that plans and procedures are frequently reviewed and revised as Fortescue's operations change and opportunities for improved management practices are identified.

This Management Plan will be reviewed at least every five years, or when significant additional information comes to hand. The review will be based on achieving approval requirements, Fortescue commitments, and progress in implementing the management plan and will incorporate any new investigations, information, techniques and advice from experts and regulatory authorities.

Upon review, the document will be revised where appropriate and the revision status will be updated in accordance with Fortescue's document control procedures.



10. CONSOLIDATED MANAGEMENT ACTIONS

Table 5 gives a summary of the management actions identified within this plan.

Table 5: Summary of Management Actions in this Plan.

| Environmental Aspect | Management Actions |
|-------------------------------------|--|
| <p>Flora and Vegetation Surveys</p> | <p>Where required, standard methodologies for flora and vegetation mapping and surveys across the Chichester Operations shall be conducted in general consistency with the EPA's guidelines for flora surveys as outlined in <i>Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia</i> (EPA, 2004) and <i>Terrestrial Biological Surveys as an Element of Biodiversity Protection Position Statement No. 3</i> (EPA, 2002).</p> <p>All planned vegetation clearing is to be assessed in accordance with Fortescue's <i>Ground Disturbance Permit Procedure</i> (100-PR-EN-0004, formerly E-EN-PP-0020) to ensure Fortescue's impacts on the environment, heritage values and land owners are managed appropriately and any management strategies for conservation significant flora and vegetation are identified.</p> <p>Any occurrences of DRF or Priority Flora or conservation significant vegetation are to be mapped and spatial data of locations and occurrences maintained in Fortescue's internal GIS system.</p> <p>All new locations of DRF or TECs are to be reported to the DEC as soon as practicable.</p> |
| <p>Threatened Flora Protection</p> | <p>Relevant personnel will be informed of their responsibilities regarding DRF and Priority Flora under the <i>Wildlife Conservation Act 1950</i> and known no-go areas will be indicated.</p> <p>Results of survey data shall be reviewed against project design to prevent the clearing of any DRF or Priority Flora where practicable.</p> <p>Where the disturbance cannot be avoided, any requisite permits from the DEC shall be sought. No disturbance of DRF is to occur until a permit has been approved by the Minister for the Environment.</p> <p>Road and other access alignments and borrow pit areas are to be constructed to avoid DRF and Priority Flora as far as practicable.</p> <p>All DRF locations are to be demarcated on the ground with appropriate fencing, signage and flagging.</p> <p>Where clearing of DRF and Priority Flora cannot be</p> |



| Environmental Aspect | Management Actions |
|---|--|
| | <p>avoided:</p> <ul style="list-style-type: none"> • Assess the local/regional conservation significance of the species prior to clearing. • Consult with the DEC regarding the proposed clearing. • Translocation of individuals to nearby similar vegetation associations will be attempted if practicable, dependent on research advice from consultant botanists and the DEC. • Seed and other propagules of DRF and/or Priority Flora planned for clearing will be collected and used for revegetation where practicable. |
| <p>Mulga and Significant Vegetation Communities</p> | <p>All personnel will be informed of their responsibilities regarding Mulga communities, including the avoidance of potential impacts as described in this plan.</p> <p>Clearing of Mulga vegetation shall be minimised as far as practicable and approved through Fortescue's internal <i>Ground Disturbance Permit Procedure</i> (100-PR-EN-0004, formerly E-EN-PP-0020)</p> <p>Implement measures stemming from research and trial programs to mitigate effects of altered drainage regime, including:</p> <ul style="list-style-type: none"> • Rock armouring • Culverts • Diversion drains • Other measures as appropriate • Action specifications detailed in the <i>Chichester Operations Surface Water Management Plan</i> (45-PL-EN-0015) <p>As per condition 12-5 of Ministerial Statement 707, Fortescue shall construct the railway having regard for this Management Plan.</p> <p>As per condition 12-6 of Ministerial Statement 707, Fortescue shall not disturb Mulga vegetation for the sole purpose of borrow pits.</p> <p>Ensure appropriate measures are undertaken in accordance with relevant Management Plans and procedures regarding:</p> <ul style="list-style-type: none"> • Erosion • Weeds • Fire • Dust • Groundwater drawdown or mounding <p>Following development of impact assessment methodologies, conduct monitoring of Mulga vegetation to assess impacts arising from Fortescue's operations.</p> |



| Environmental Aspect | Management Actions |
|---|--|
| | <p>For all water transfer pipelines, design corridor to minimise impact on surface water movement in Mulga woodlands so that significant drainage shadows are avoided.</p> |
| <p>Development of Impact Assessment Criteria for Mulga and Other Significant Vegetation Communities</p> | <p>Implement and maintain impact assessment criteria and monitoring methodology to determine the impact of Fortescue's operations on surrounding significant vegetation.</p> <p>Ongoing assessment of impacts shall consider the following criteria:</p> <ul style="list-style-type: none"> • Vegetation Structure • Vegetation Composition • Vegetation health/condition • Stress indicators such as vigour, level of leaf fall or discolouration, dieback, disease/insect attack, or mortality rates • Clearing boundaries • Changes in groundwater levels • Level of dust smothering vegetation • Other indicators as appropriate. <p>As per the <i>Chichester Operations Groundwater and Bore Management Plan (45-PL-EN-0005)</i> use hyperspectral aerial photography to map vegetation condition, water loss and dust deposition as a baseline tool and for ongoing annual monitoring.</p> <p>In addition to the vegetation monitoring outlined in the <i>Chichester Operations Groundwater and Bore Management Plan (45-PL-EN-0005)</i>, monitor for the potential impact that groundwater drawdown may have on phreatophytic eucalypts, including <i>Eucalyptus camaldulensis</i> and <i>E. victrix</i>. Where impacts are detected, and the areas are not planned for mining within the next two years, take remedial action to supplement the source of groundwater.</p> |
| <p>Further Investigations</p> | <p>Implement targeted studies to assess:</p> <ul style="list-style-type: none"> • Regeneration methods; • Seed ecology; and • Other studies as required (e.g. threatened flora translocation, Mulga ecology, phreatophytic vegetation response to groundwater variation). <p>Develop research projects and strategies to investigate key areas identified. Engage research institutions, consultants and personnel, as required, to carry out the research.</p> <p>Ensure research results are disseminated to relevant personnel throughout Fortescue and incorporated into all relevant management plans and procedures.</p> |



11. REFERENCES

- Department of Environment and Conservation (2008) *FloraBase*. <http://florabase.calm.wa.gov.au/conservationtaxa>. Accessed March 2008.
- Environmental Protection Authority (2002) *Terrestrial Biological Surveys as an Element of Biodiversity Protection Position Statement No. 3*, March 2002.
- Environmental Protection Authority (2004) *Guidance for the Assessment of Environmental Factors Western Australia (in accordance with the Environmental Protection Act 1986) Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia No. 51*.
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- Environ Australia (2005b) *Pilbara Iron Ore and Infrastructure Project. Cloud Break. Public Environmental Review*, January 2005.
- Fortescue Metals Group Limited (2006) *Fire Management Plan 100-PL-SA-0003*, 31 August 2006.
- Fortescue Metals Group Limited (2008) *Ground Disturbance Permits Procedure 100-PR-EN-0004 (formerly E-EN-PP-0020)*, 6 May 2008
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- Fortescue Metals Group Limited (2006c) *Rail Corridor: Surface Water Management Plan*, R-PL-EN-0011, formerly 204-60-EN-RP-0003, 30 October 2008 (requirement for Ministerial Statement 690 only).
- Fortescue Metals Group Limited (2009) *Accident – Incident Reporting Procedure 100-PR-SA-0011*, 15 May 2009.
- Fortescue Metals Group Limited (2009) *Weed Hygiene and Management Plan*, 45-PL-EN-0013, formerly E-SA-RP-0106-1145, 11 August 2009.



Fortescue Metals Group Limited (2009) *Fortescue Marshes Management Plan* 45-PL-EN-0009, 11 August 2009.

Fortescue Metals Group Limited (2009) *Chichester Operations Groundwater and Bore Management Plan* 45-PL-EN-0005, 21 August 2009.

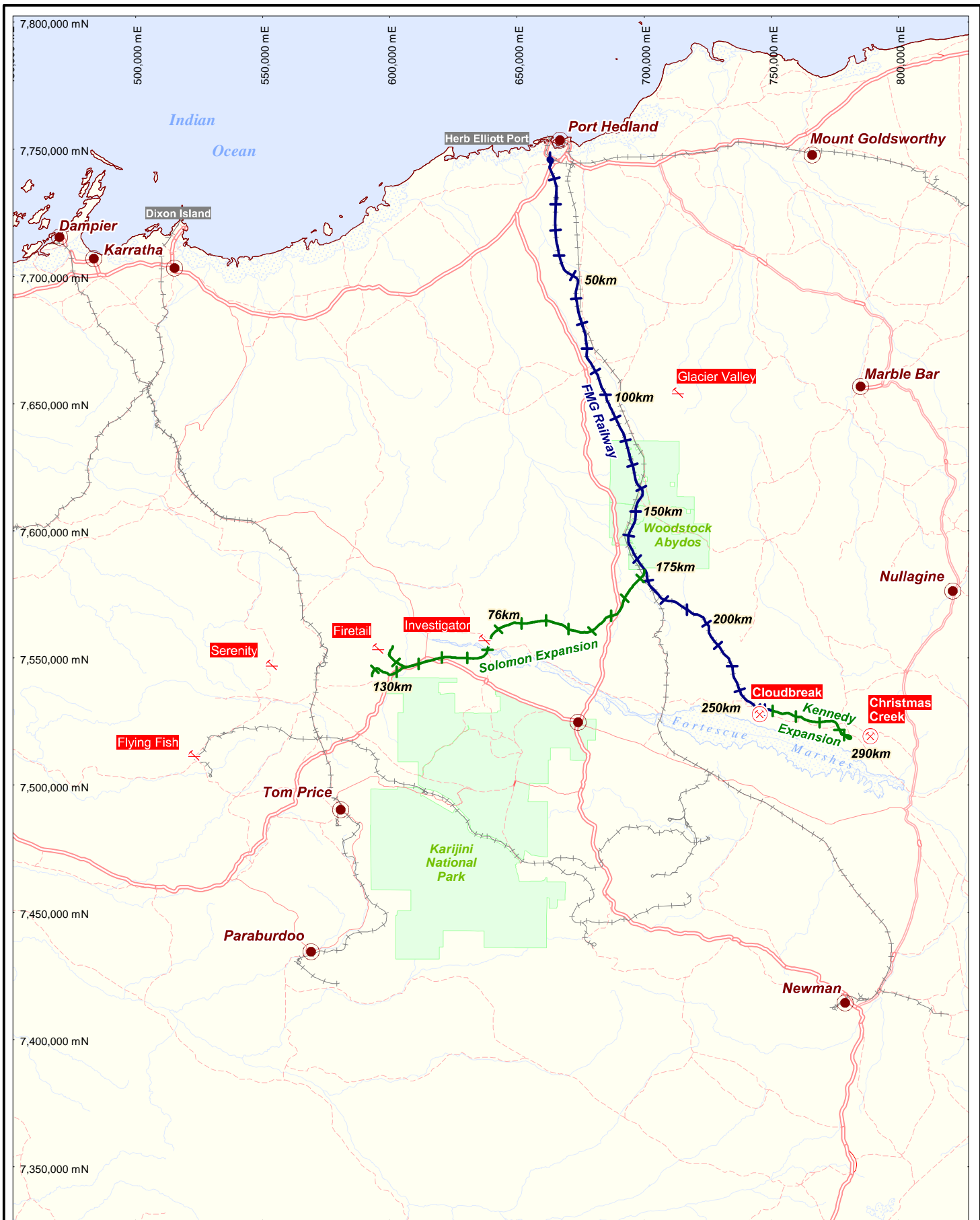
Fortescue Metals Group Limited (2009) *Chichester Operations Dust Management Plan* CB-PL-EN-0009, 23 October 2009

Fortescue Metals Group Limited (Preparation) *Stakeholder Consultation Strategy* 100-PH-EN-0003.

Figures

Figure 1
Regional Project Location

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Location Map

Legend

- Towns
- Major Roads/Tracks
- Creeks
- + FMG Railway
- + FMG Proposed Railways
- Other Railways
- ⊗ FMG Mines
- + FMG Resources

0 20 40 80
kilometres

Fortescue Metals Group Ltd

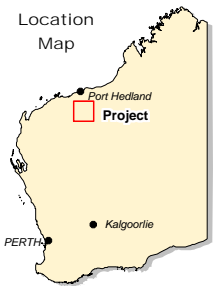
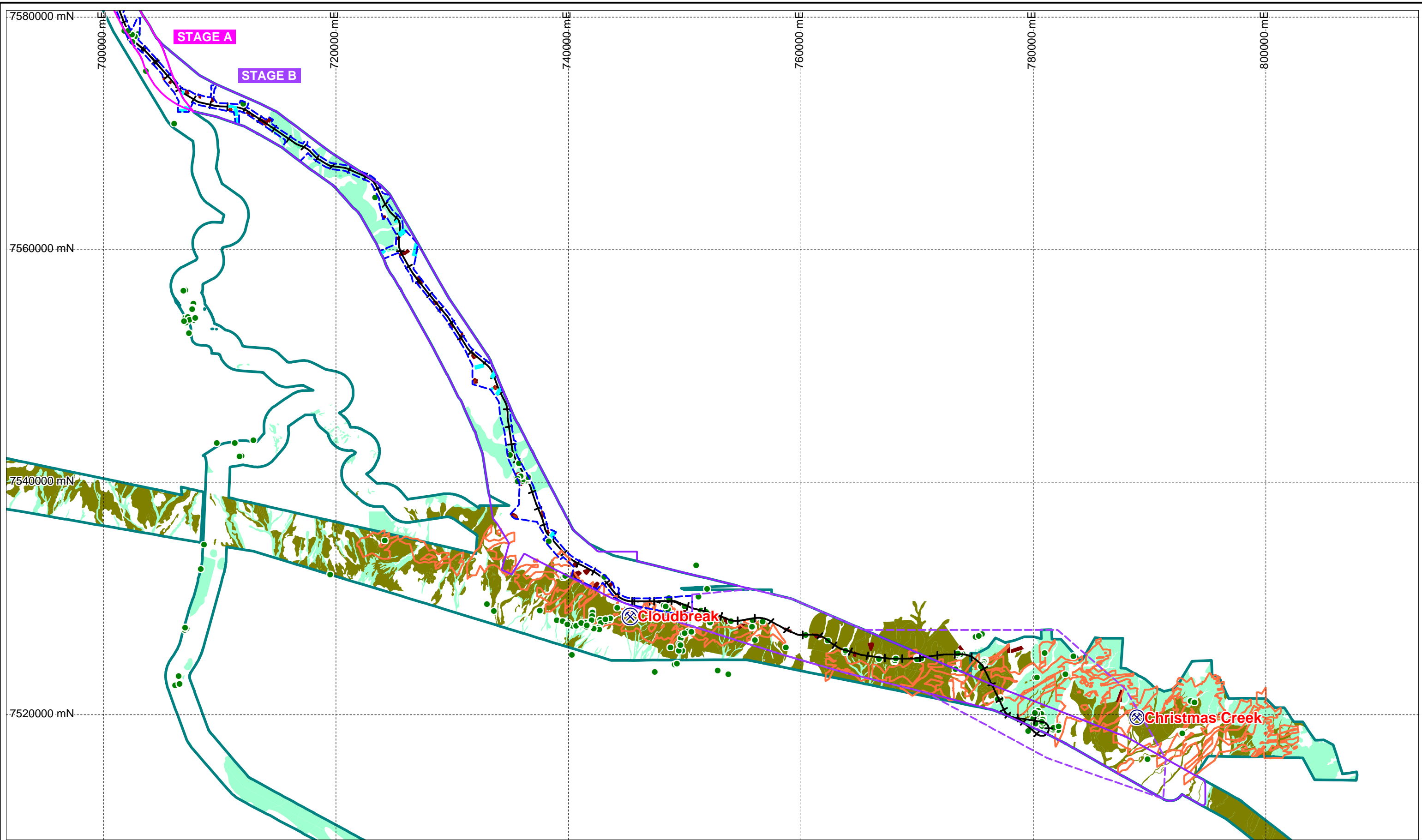
Regional Project Location

| | |
|----------------------------------|--------------------|
| Author: P. Connolly | Date: 3/8/2009 |
| Drawn By: U. Boldbayar | Revision: 0 |
| Doc No: 100_MP_EN_0003 | Confidentiality: 1 |
| Projection: MGA Zone 50 (GDA 94) | Scale: 1:2million |

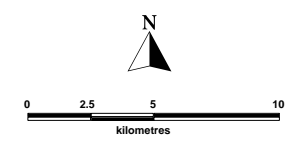
Figure 2

Mulga-dominated Vegetation and Vegetation Containing Mulga and Priority Flora Locations throughout the Chichester Operations Area

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- FMG Rail Corridor
- FMG Vegetation Survey Area
- Water Targets
- Borrow Pits
- Mulga-dominated Vegetation
- Vegetation containing Mulga
- FMG Rail Centreline
- FMG Rail - Stage A
- FMG Rail - Stage B
- FMG Rail Investigation Corridor
- Priority Flora
- Mine Pit Outlines



FMG Fortescue Metals Group Ltd

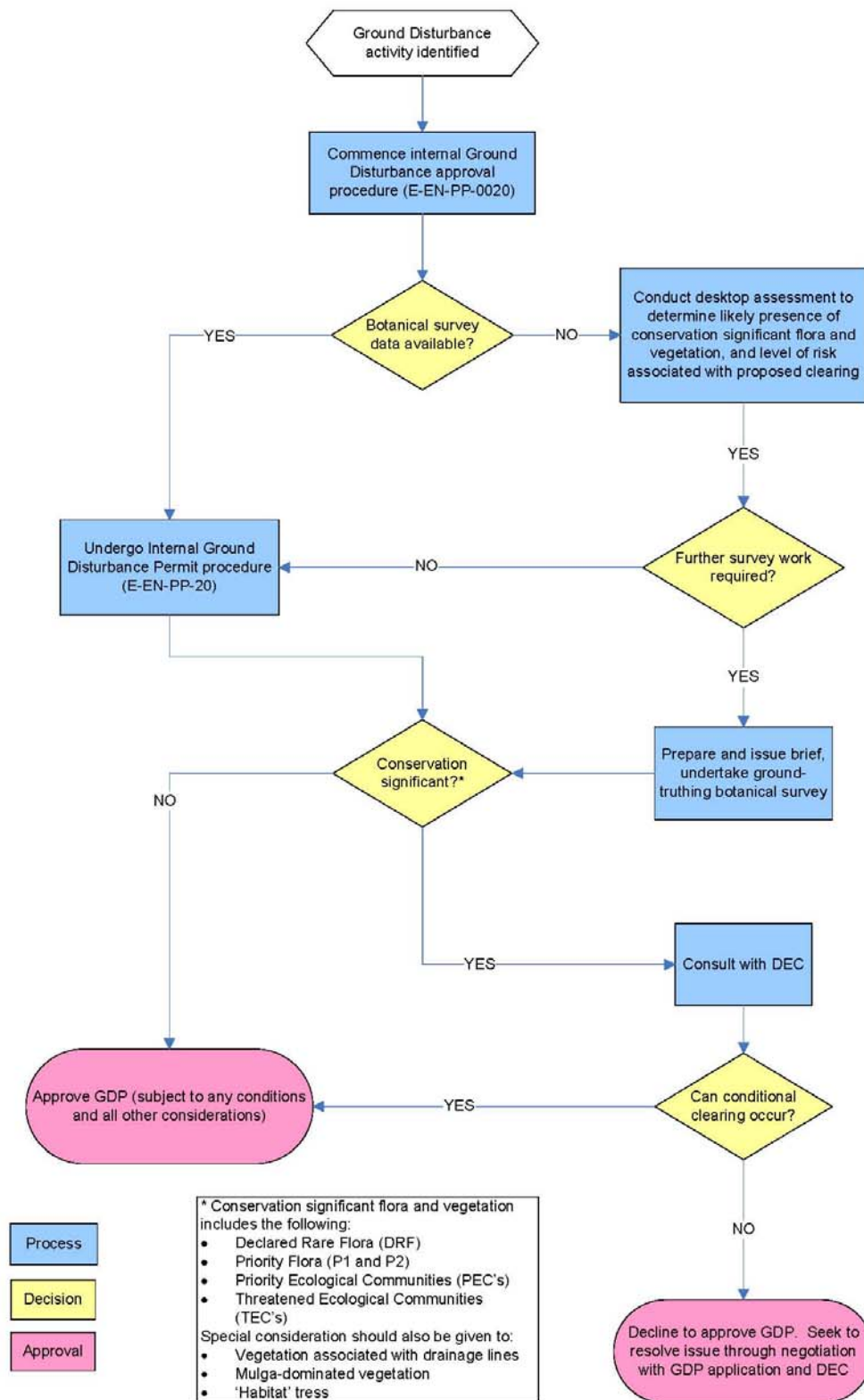
FIGURE 2
Mulga-Dominated Vegetation
and Vegetation Containing Mulga

| | |
|-------------------|----------------------------------|
| Author: K. Burke | Date: 15/02/2008 |
| Drawn By: UB / AW | Revision: 04/08/2009 |
| Dwg No: 08_108 | Report No: |
| Scale: 1:300,000 | Projection: MGA Zone 50 (GDA 94) |

Figure 3

Internal Vegetation Survey Requirement: Assessment Process

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Internal Vegetation Survey Requirement: Assessment Process

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Appendices

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Appendix A

Conservation Categories of Flora and Vegetation Communities

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Table A1: Definition of Rare and Priority Flora Species (Department of Environment and Conservation 2008)

| Conservation Codes | Category |
|--------------------|---|
| X | <p>Declared Rare Flora – Extinct Taxa</p> <p>Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State’s Endangered Flora Consultative Committee.</p> |
| R | <p>Declared Rare Flora – Extant Taxa</p> <p>Taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State’s Endangered Flora Consultative Committee. (= Threatened Flora = Endangered + Vulnerable).</p> |
| P1 | <p>Priority One – Poorly Known Taxa</p> <p>Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as ‘rare flora’, but are in urgent need of further survey.</p> |
| P2 | <p>Priority Two – Poorly Known Taxa</p> <p>Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as ‘rare flora’, but are in urgent need of further survey.</p> |
| P3 | <p>Priority Three – Poorly Known Taxa</p> <p>Taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as ‘rare flora’, but are in need of further survey.</p> |
| P4 | <p>Priority Four – Rare Taxa</p> <p>Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years</p> |

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Table A2: Categories of Threatened Flora Species (Commonwealth Environment Protection and Biodiversity Conservation Act 1999)

| Category Code | Category |
|---------------|--|
| Ex | <p>Extinct</p> <p>Taxa which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.</p> |
| ExW | <p>Extinct in the Wild</p> <p>Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.</p> |
| CE | <p>Critically Endangered</p> <p>Taxa which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.</p> |
| E | <p>Endangered</p> <p>Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.</p> |
| V | <p>Vulnerable</p> <p>Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.</p> |
| CD | <p>Conservation Dependent</p> <p>Taxa which at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.</p> |