



Red Hill Quarry

West Quarry Extension Area A

Screening and Rehabilitation Plan

Ministerial Statement 912

March 2014

PURPOSE AND METHODOLOGY

This Screening and Rehabilitation Plan for the West Quarry Extension Area A (Figure 1) is prepared in response to Ministerial Statement 912 issued by the Minister for Environment; Science, as a *Section 46 Environmental Protection Act 1986* Statement in relation to the relocation of the Herne Hill operation; issued 9 October 2012.

Statement 912 was prepared in response to the Public Environmental Review (PER 2008) prepared by Straegen on behalf of Hanson Construction Materials Pty Ltd.

The PER 2008, was the subject of comprehensive public consultation and review.

As a result of the PER 2008, the Environmental Protection Authority released *Report 1381, Red Hill Quarry Development, Hanson Construction Materials Pty Ltd* in January 2011.

The Minister for the Environment released Statement 912 as a result of the 2008 Public Environmental Review in relation to development of the quarry.

The EPA Assessment number for the proposal is 1669 and the Report to the Environmental Protection Authority is 1381.

Ministerial Statement 912 provides for approval to extend the existing operations to the west and north west. It was issued as a result of formal review and assessment of the proposed expansion

Ministerial Statement 912 approval is additional to Ministerial Statement 705 which was issued on 21 December 2005 and *modified Ministerial Statement 199, Assessment Number 354, (EPA Bulletin 510)* issued on 4 December 1991.

Statement 705 also required the preparation of a Screening and Rehabilitation Plan for the existing pit. The Section 705 Screening and Rehabilitation Plan was prepared in March 2007.

There are in effect two Screening and Rehabilitation Management Plans running concurrently, the first addressing Ministerial Statement 705 and this one addressing Statement 912.

This Screening and Rehabilitation Plan is restricted to the West Quarry Extension Area A (Figure 1) and stockpile area, but will contain information on the methods used for rehabilitating and providing visual management of the existing operations.

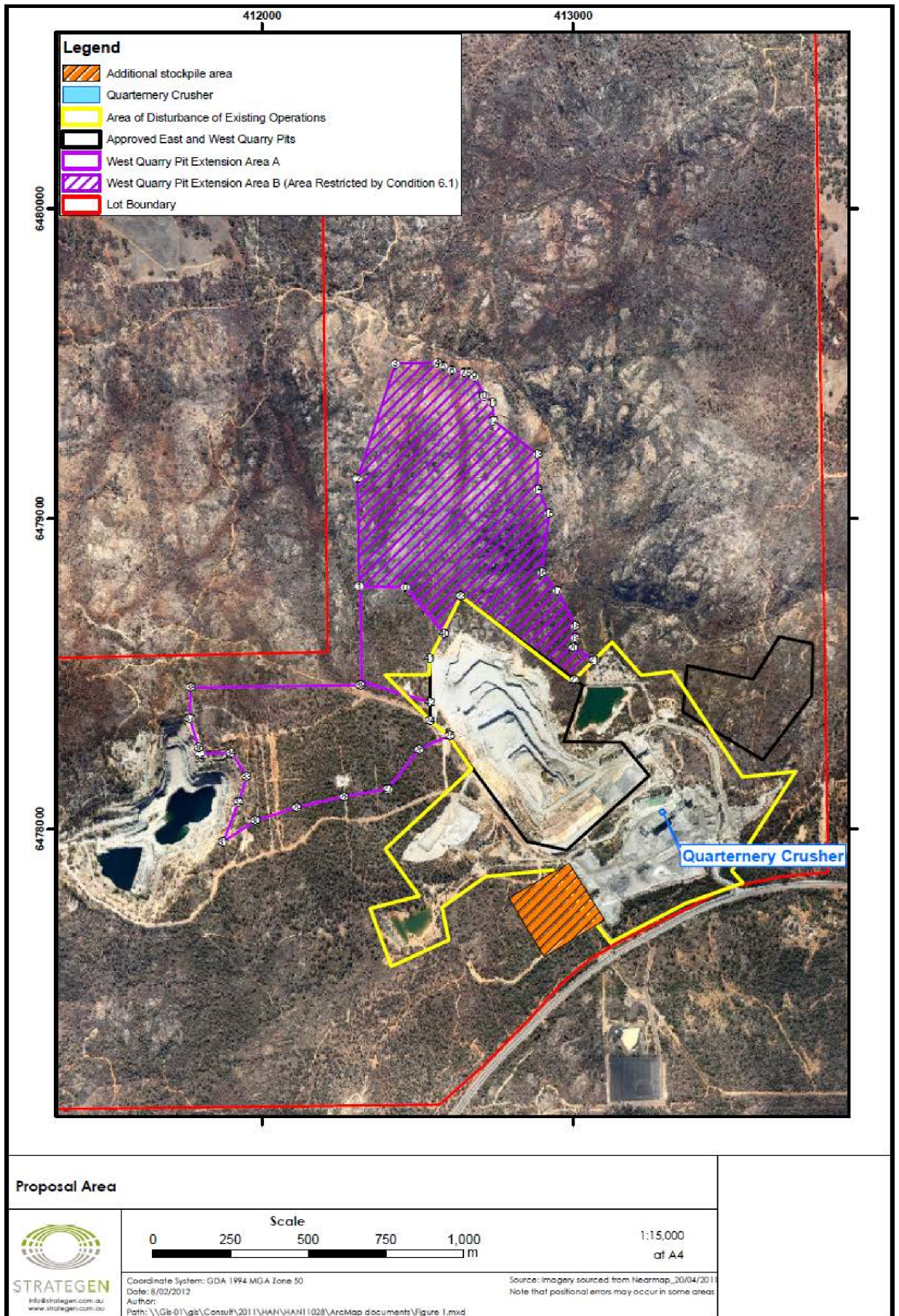
The information on the existing operations demonstrates that the methods currently employed are very successful and will be able to provide a high level of visual management during future excavation.

Hanson Construction Materials Pty Ltd owns Lot 11. Hanson designs and stages the operations in combination with effective rehabilitation as the key methods used to minimise visual impacts associated with quarrying.

Visual management and rehabilitation is the responsibility of Hanson Construction Materials. Both are conditioned in the various approvals in place for the operations.

This Screening and Rehabilitation Management Plan has been addressed in a number of sections;

1. Requirements and regulatory framework.
2. Assessment of the potential visual Impact footprint.
3. Translation of the potential impact to the staging of quarrying, rehabilitation and timing.
4. Development of methods to best manage visual impact and comparisons to current practices.
5. Summary of the existing physical and biological environment
6. Assessment of past rehabilitation.
7. Proposed rehabilitation methods.
8. Monitoring and reporting.



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1.0 REQUIREMENTS AND REGULATORY FRAMEWORK

1.1 Background

The Red Hill quarry lies within an area of the Darling Scarp covered by remnant vegetation that provides a buffer for the quarry. The quarry and associated infrastructure lie on the southern side of Susannah Brook, extending to Toodyay Road.

The Red Hill Quarry was opened and brought into production in 1996. This involved clearing for both the quarry site and the infrastructure associated with the quarry. In the early years the only land available to be restored was the batters and bunds surrounding the development areas. These were landscaped and revegetated as part of the landscaping of the site.

The quarry is located on land held by Hanson that originally comprised 1,035 hectares. In 2003 a portion of the land in the north western corner was sold to the Government for inclusion in the Darling Range Regional Park, leaving approximately 800 hectares owned by the Company.

Of the 800 hectares held by Hanson Construction Materials, only approximately 80 hectares has been currently cleared for the Red Hill operations. Almost all the remaining land is retained as indigenous vegetation in good to excellent condition as a buffer for the operations.

Statement 912 provides approval for extension of the quarry by approximately 32 hectares with an additional stockpile area of about 5 hectares taking the amount of disturbed ground to near 120 hectares. With rehabilitation progressively following excavation, not all of that area will be open at any one time and a substantial proportion of the disturbed land that may be visible is planned to be rehabilitated at that time.

As part of the formal assessment process the physical and biological environment of the whole of Hanson landholding has been assessed.

In summary the following have been completed as part of the data collection for the proposed extension. Most of the data is subject to ongoing assessment and monitoring.

- Updated geology through diamond and percussion drilling
- Updated quarry planning
- Additional blast management and acoustic assessments
- Updated dust risk assessments and management
- Updated hydrogeology and water management
- Additional archaeological and ethnographic studies
- Reassessment of flora and vegetation
- Reassessment of fauna
- Additional dieback survey
- Updated weed and exotic species surveys
- A number of visual assessments
- Continued reassessment of rehabilitation

- Ongoing consultation with the local community, Government agencies and the traditional owners.

Re-establishment of the local flora was deemed a key principle in the rehabilitation to be used on site and this was picked up in the Rehabilitation Plan developed and approved for the Red Hill Quarry in 1996.

Since 1996 approximately 160 500 tube plants have been planted at the Red Hill site in addition to over 100 kg native seed (25 kg in 1997 alone). This included the following numbers of tube plants in the past few years since the preparation of the Screening and Rehabilitation Plan for Statement 705;

20 000 in 2007
30 000 in 2008
11 650 in 2009
15 000 in 2010
15 000 in 2011
5 993 in 2012
16 500 in 2013

1.2 Regulatory Framework

A number of commitments and conditions were made as a result of the Public Environmental Review Process and resulted in *Ministerial Statement 199, Assessment Number 354, (EPA Bulletin 510)* issued on 4 December 1991.

Conditions relating to rehabilitation and visual management are relevant to this report.

On 21 December 2005 further conditions were added as part of Ministerial Statement 705.

On 9 October 2012 conditions relevant to the western extension were added as part of Ministerial Statement 912.

In addition the various other approvals, which have been renewed or updated, are also issued as conditional approvals. These include;

- Planning Consent from the Western Australian Planning Commission (through the State Administrative Tribunal) was renewed for 20 years until 14 February 2033.
- An Extractive Industries Licence was issued by the City of Swan for ten years, ending on 23 April 2023.
- A Works Approval (W5350/2013/1) was issued on 29 April 2013 for the enhancement to the crushing plant and construction of a quaternary crusher. The Works Approval lifted annual production to 1 200 000 tonnes. The production figure will be updated in the DER Licence when issued.
- A licence through the Department of Environment Regulation was issued on 1 October 2010 and is current until 30 September 2015 DER. Licence (4414/11).

Ministerial statements and the Department of Environment Regulation Licence are issued under the *Environmental Protection Act 1986* which overrules all other legislation.

Therefore if there is a conflict in the conditions applying to the site those issued under the *Environmental Protection Act 1986* will prevail.

The Ministerial Conditions relating to rehabilitation and visual management that are still current from the 1991 Ministerial Statement are listed below.

Ministerial Statement 199, Assessment Number 354, (EPA Bulletin 510).

Condition 4

- 4-1 *Within twelve months of the date on this statement, the proponent shall prepare detailed plans for the ongoing rehabilitation of Pioneer No 1 and Pioneer No 2 quarries. These plans shall be to the satisfaction of the Environmental Protection Authority on advice from the Shire of Swan.*
- 4-2 *Subsequent to Condition 4-1, the proponent shall implement the approval plans, and updates as required by Condition 4-3, to the satisfaction of the Environmental Protection Authority on advice of the Shire of Swan.*
- 4-3 *Subsequent to Conditions 4-1 and 4-2, the proponent shall review the rehabilitation plans annually for the first two years and thereafter at five yearly intervals. The reviews shall be to the satisfaction of the Environmental Protection Authority on advice from the Shire of Swan.*

Commitments

- 8 *Site clearance and vegetation removal will be minimised by survey control and supervision of personnel engaged in clearing activities.*
- 9 *All vehicles entering the site from regions identified as potentially contaminated with dieback disease will be thoroughly washed to remove adhering soil and weed seeds. All fill or soil used on the site will be obtained from uncontaminated sources. Procedures for preventing its introduction will follow those laid down by CALM Dieback Manual.*
- 11 *Fire prevention measures as per relevant Shire and Brigade regulations will be enforced within the project area and on the rest of Pioneer's land holding.*
- 12 *Unauthorised vehicular access to the Pioneer landholding will not be permitted and the current practice of using security guards to patrol the area will be continued.*

- 13 *Pioneer will monitor the vegetation on its property to detect any outbreaks of dieback disease. If any is detected, Pioneer will consult with the Department of Conservation and Land management to determine a suitable treatment strategy.*

Ministerial Statement 912 as a Section 46 Environmental Protection Act 1986

On 9 October 2012 the Minister for Environment; Science issued Ministerial Statement 912 as a *Section 46 Environmental Protection Act 1986* statement in relation to the extension of the existing pit.

The relevant part of the statement is printed below.

10. Screening and Rehabilitation of West Quarry Pit Extension Area A

10-1 *Prior to undertaking vegetation clearing, the proponent shall prepare a Screening and Rehabilitation Plan for all disturbed areas in West Quarry Pit Extension Area A (Figure 1) and associated stockpiles and overburden dumps, to the satisfaction of the CEO.*

10-2 *The objective of the Screening and Rehabilitation Plan required by condition 10- 1 is to ensure that rehabilitation of the West Quarry Pit Extension Area A and associated stockpiles and overburden dumps achieves a stable and functioning landform which provides generally similar landscape characteristics having regard to the use of the land and which minimises visual impacts of the quarry operation on other land.*

10-3 *The Screening and Rehabilitation Plan required by condition 10-1 shall:*

1. *identify land within a six kilometre radius of the West Quarry Pit Extension Area A from which the quarry pit is visible;*
2. *detail the screening and rehabilitation practices to be implemented over the life of the operations (including planting of indigenous vegetation) for West Quarry Pit Extension Area A and associated stockpiles and overburden dumps;*
3. *specify the short and long term measures to be taken to address visual impacts from West Quarry Pit Extension Area A, particularly for land identified in 10-3-1; and*
4. *specify time frames for the implementation of all screening and rehabilitation measures.*

10-4 *In preparing the Screening and Rehabilitation Plan required by condition 10-1 the proponent is to consult with owners and occupiers of the land referred to in condition 10-3-1.*

10-5 *The proponent shall implement the Screening and Rehabilitation Plan required by condition 10-1.*

- 10-6 The proponent shall report the progress of conditions 10-1 to 10-5 in the compliance assessment report required by condition 4-6.*
- 10-7 The proponent shall commission an Independent Specialist to assess the proponent's performance against the Screening and Rehabilitation Plan required by condition 10-1 at intervals no greater than two years, with the Independent Specialist's assessment report being provided to the CEO within 20 business days of it being received by the proponent.*
- 10-8 The proponent shall make the Screening and Rehabilitation Plan required by condition 10-1 and the reports under conditions 10-6 and 10-7 publicly available in a manner approved by the CEO.*
- 10-9 Screening and rehabilitation activities shall continue until such time as the CEO determines that the proponent's screening and rehabilitation responsibilities required by Condition 10 have been fulfilled*

2.0 COMMUNITY CONSULTATION

2.1 Public Quarry Visits

Community open days have been held annually in February for residents who are interested and those who can potentially see the operations since 2006. The community meetings arose from Ministerial Statement 705. In 2014 only five community members attended.

During the meetings any issues relating to visual and other matters are raised. These are reported annually in the report relating to the progress of visual management prepared in March each year and submitted to the DER, EPA and attendees of the meeting.

Over the years there has also been irregular contact with local residents and organisations, although the local groups have, over the years, shown less interest as the Red Hill site has become "a normal part of the Red Hill land uses". Nowadays few residents contact the quarry.

2.2 Community Consultation – Statement 912

A community meeting was held on 21 November 2013 following Hanson letter dropping dwellings and lots within a 6 km radius of the operations as part of the community consultation for Ministerial Statement 912.

In all approximately 600 letters were sent to residents. An email address and contact numbers were provided together with a site photograph and a brief summary of the purpose of the consultation and an explanation of the purpose for that consultation.

On the day less than 20 persons attended representing only several families. The proposed extension of the quarry was outlined to the community members through a visual powerpoint presentation. Discussions were then held on the operations in general and West Quarry Extension Area A.

Some illustrations were available to interested persons and anyone who requested was provided with a CD of the 2013 Annual Assessment of the Screening and Rehabilitation Plan for Statement 705.

The methods of assessing the visual impacts were explained.

A tour of the quarry was made followed by the opportunity for further discussion and questions.

Overall there were no significant issues raised by the members of the community. Most of the discussion focussed on the general operations of the quarry and the processing and rehabilitation.

There did not appear to be significant concern in relation to the visual management and the impact it might have on members of the community. It should be noted that the owners of the land from which the quarry is most likely to be visible are already involved in the existing community consultation program.

All interested parties will be provided with a copy of this Screening and Rehabilitation Plan.

Hanson will continue with the Statement 912 Community Liaison Group and take on board any matters that are raised.

As a minimum there will be an annual meeting, towards the end of 2014.

Matters raised during the public consultation were mainly related to those listed below. Few concerns were expressed with the potential visual impacts and management.

1	Discussion was held on the potential to move the powerline and the implications that would have for excavation and visual management.	<ul style="list-style-type: none"> The potential to move the power line was outlined to the meeting. If moved this would involve modification to the Planning Approval.
2	Discussions and questions were received with respect to the rehabilitation, species chosen and general biological information in relation to local vegetation.	<ul style="list-style-type: none"> All questions were answered. The queries generally related to species, local gardens, soil types and other general issues only partially related to the quarry rehabilitation.
3	The existing rehabilitation around the operations and in particular the southern face were discussed and viewed.	<ul style="list-style-type: none"> See above
4	Blasting was discussed	<ul style="list-style-type: none"> Blasting was explained in terms of design, frequency, likely impacts and measurement.
5	The presence of Watsonia along Susannah Brook was raised.	<ul style="list-style-type: none"> This was discussed and a commitment made to increase the control efforts in 2014. That control has been actioned.
6	The potential for a fire break to be formed along the western boundary of Lot 11 was questioned rather than using the existing roads in that area.	<ul style="list-style-type: none"> Fire breaks were discussed and the construction of an additional break will be actioned in 2014.
7	Revegetation of and access to the Herne Hill Site was raised.	<ul style="list-style-type: none"> The additional revegetation on the old site was discussed as was the need to maintain the access roads in that location.
8	Questions were asked in relation to the aboriginal heritage features on site.	<ul style="list-style-type: none"> General discussions were held with respect to the various heritage features.
9	A question was raised in regard to the need to open more ground rather than deepen the pit.	<ul style="list-style-type: none"> The pit footprint must be enlarged to enable the haul roads to be extended downwards as there is a limit on the safe gradient of the haul roads. Deeper benches are constrained by the width of the footprint.
10	A question was asked relating to why the pit was trending to the west rather than the south west on top of the Scarp	<ul style="list-style-type: none"> The top of the scarp has excessive overburden, which must be placed somewhere. This will require very large dumps of overburden to be placed on indigenous vegetation or other locations, because there would be excess material for backfill or rehabilitation of the quarry faces.
11	Some discussions were raised in relation to the original footprint of the quarry.	<ul style="list-style-type: none"> The original east pit was not opened because of greater visual impact to the North West. Only the west pit from the original PER has been quarried.
12	A comment was made on the vigour of growth of the trees along the benches	<ul style="list-style-type: none"> The vegetation on the southern rehabilitated face was viewed and discussed.

3.0 MONITORING AND REPORTING

Compliance Reporting

Compliance reporting is conditioned in Conditions 4-4 to 4.6 of Ministerial Statement 912.

The relevant sections are listed below.

4-4. Compliance Reporting

4-1 The proponent shall prepare and maintain a compliance assessment plan to the satisfaction of the CEO.

4-2 The proponent shall submit to the CEO the compliance assessment plan required by condition 4-1 at least six months prior to the first compliance report required by condition 4-6, or prior to implementation, whichever is sooner.

The compliance assessment plan shall indicate:

- 1. the frequency of compliance reporting;*
- 2. the approach and timing of compliance assessments;*
- 3. the retention of compliance assessments;*
- 4. the method of reporting of potential non-compliances and corrective actions taken;*
- 5. the table of contents of compliance assessment reports; and*
- 6. public availability of compliance assessment reports.*

4-3 The proponent shall assess compliance with conditions in accordance with the compliance assessment plan required by condition 4-1.

4-4 The proponent shall retain reports of all compliance assessments described in the compliance assessment plan required by condition.

4-5 The proponent shall advise the CEO of any potential non-compliance within seven days of that non-compliance being known.

4-6 The proponent shall submit to the CEO a compliance assessment report in February each year addressing the twelve month period from January to December of the previous year.

The compliance assessment report shall:

- 1. be endorsed by the proponent's State Manager - Quarries or a person delegated to sign on the State Manager's behalf;*
- 2. include a statement as to whether the proponent has complied with the conditions;*
- 3. identify all potential non-compliances and describe corrective and preventative actions taken;*

4. *be made publicly available in accordance with the approved compliance assessment plan; and*
5. *indicate any proposed changes to the compliance assessment plan required by condition 4-1.*

The compliance documentation to be prepared and submitted will contain the commitments for monitoring and reporting.

An annual Assessment of the success of the Screening and Rehabilitation Plan for Statement 912 will be prepared each year and submitted to the relevant authorities.

This assessment will be independent of the reporting for Statement 705.

The annual assessment will document the on going success of the screening and rehabilitation of the West Quarry Extension Area A;

- The rehabilitation undertaken during the previous year,
- The success of the rehabilitation.
- The success of the visual management.
- Photographic documentation of the progress of the screening and rehabilitation.
- The results of the public consultation and community meeting.
- Complaints in relation to visual management or rehabilitation.
- Actions that have flowed from the consultation and assessments.
- Any other relevant issues.
- A copy of the documentation will be provided to all participants and interested parties.

VISUAL ASSESSMENT AND MANAGEMENT

4.0 VISUAL IMPACTS

4.1 Introduction

The Red Hill site lies behind the Darling Scarp on the southern side of Susannah Brook valley. The site was chosen because the pit is well hidden from most of the Swan Coastal Plain. The green painted processing plant can be seen in the distance from some parts of the Swan Coastal Plain. The operations are partially visible from some locations to the north of Susannah Brook.

However as the quarry now has to turn west rather than north, and in turn is potentially constrained by a major powerline, the operations may be more visible from some places.

Even so most areas of close range visibility lie either on land held by Hanson or adjoining land held by Midland Brick, a Boral Company, which is currently used for clay extraction and is an approved hard rock quarry site.

Longer range visibility of the site can be glimpsed from the top of the plateau on the northern side of Susannah Brook where subdivision has occurred. Whilst the land identified as potentially able to be seen is much wider generally in a north and north westerly direction, in reality the actual area from which the pit can be seen is much smaller because of intervening remnant vegetation, planted trees, and the landform. See Figures 2 and 3.

The majority of this land is rural land or resource zoned land or rural living as shown on Figure 2.

4.2 Policies

There is two relevant Policies and Guidelines applicable to visual assessment in Western Australia.

WAPC 2007, Visual Landscape Planning in Western Australia

This document provides guidance on how to assess the risk of visual impact and the methods that can be used to minimise the risks in Western Australia.

This manual identifies a number of steps in the visual management process.

- Define the scope of the assessment
- Describe the visual landscape character
- Evaluate the way the visual landscape character is viewed, experienced and valued
- Develop strategies for managing visual landscape character
- Implement strategies.

DPUD 1993, Darling Range Regional Park and Landscape Study

This study identifies the land associated with Susannah Brook and the other watercourses and valleys of the Darling Scarp as being areas of Landscape Sensitivity. The same areas are classified as having High Scenic Quality.

The sensitive areas are located on the valley sides generally off the laterite plateau remnant soils and include the quarry footprint and the land down to and across Susannah Brook.

4.3 Assessment of the Visual Character and Impact

The proposed extension has been the subject of extensive research, assessment and consideration for several years, covering a large potential disturbance footprint. The approval provided by Ministerial Statement 912, restricts the approval to the area shown in Figure 1, by excluding the northern portion of the footprint.

During the research and assessment processes John Cleary Planning was asked to review the visual management of the proposed extension. This was provided in the report;

John Cleary Planning, 2007, Red Hill Quarry Proposed Development, Toodyay Road, Red Hill, Landscape and Visual Assessment.

The assessment formed part of the application during the EPA formal assessment for the extension.

This document extensively covered the local landscape character and assessment using similar methodology as that outlined in WAPC 2007. The same parameters were assessed and considered and a number of recommendations made.

As Cleary 2007 considered the northern part of the extension which did not receive approval the visual assessment represents a worse scenario than the approved footprint.

During the study computer modelling was used through aerial photography overlaid on a digital elevation model.

This enabled three dimensional (3D) real time manipulation and modelling of the landscapes, to determine the locations from which the operations would be visible, and the staging of the rehabilitation to assist in managing the visual impacts. Many field views were taken and compared to the modelling to assist the process.

From the data a map of the areas from which the "whole applied for area" might be visible was prepared (Page 32 of the Cleary Report 2007). This overstates the potential impacts because the area covered included ground that is not approved to be disturbed and because the influence of trees and other built structures was not considered. That plan was included as Figure 7 in EPA Report 1381.

An addendum was provided by John Cleary Planning dated February 2008 that included additional viewsapes and considered the stockpile area.

As Cleary 2007 comprehensively covered all the issues related to visual assessment and management, using the same methodology also used in WAPC 2007, it is not proposed to repeat the information here.

This document is to address the conditions provided in Ministerial Statement 912 and how to address the operations to minimise visual impact over the life of the operations.

In February 2013, Allering and Associates prepared additional 3D modelling of the proposal to assess the potential for a 100 metre setback from the western boundary during the application for planning consent to the City of Swan;

Allering 2013, Hanson Construction Materials Pty Ltd – Development Application – Red Hill Quarry, Lot 11, Toodyay Road, Red Hill, City of Swan.

Allering 2013 also used aerial photography overlaid on a digital elevation model that was able to give real time generated views of the pit from any direction or elevation. Again this is a “worst case” scenario in that local developments and vegetation are not included.

The computer modelling and extending the potential affected area out to 6 km did slightly enlarge the potentially affected areas, but reduced the potentially affected areas south of the operations.

The model remains available to Hanson and has been used in the preparation of this document. At any time Hanson can select any viewpoint and obtain a computer generated image of the viewscape from that location.

4.4 Potential Visual Impact of the West Quarry Extension Area A

The area from which the approved extension can be seen is generally to the north and north west. The requirement also included the stockpile area to be considered. To assist this process several key locations were selected as representative of the viewscales. The points selected include the locations from which the extension is potentially most visible. See Figures 2 and 3.

The Allering 3D modelling was used to show the locations from which there was potential visual impact. These locations were then checked in the field from the roads and some dwellings to ascertain the most likely impacts.

It is unclear how many dwellings are included in this affected footprint. However Condition 10-3 (1) of Statement 912 requires all land within a 6 kilometre radius to be identified and within that footprint there are approximately 600 dwellings and associated parcels of land.

Only the processing area or rehabilitated bunds are potentially seen from south of the south, with the exception of the top of some stockpiles from one location on Toodyay Road. The pit cannot be seen from the south.

The green painted top of the processing plant is visible from a wider area including parts of the nearby Swan Coastal Plain.

Ministerial Statement 912 only requires the impacts of the extension and stockpiles to be considered. The Statement does not include existing operations.

Existing operations are partially covered by the Screening and Rehabilitation Plan developed as a result of Statement 705. The existing operations have been included in all environmental management since the first disturbances and opening in 1998.

Even so management of visual impacts and rehabilitation of the extension will in turn assist in the management of other aspects of visual impact for all parts of the operations such as trees and local vegetation, combined with local developments, which can obscure the quarry.

For example see the modelled and actual visual impact from Joshua Mews in Figures 6 and 7.

Parts of the West Quarry Extension Area A are visible from the southern end of Daniel Place, the northern end of Joshua Mews, possibly a small section of Weir Road in Baskerville and north west across parts of Baskerville, Millendon, Herne Hill, and a small area in Brigadoon. In most cases the pit is only visible where trees have been removed, or, in the case of Daniel Place for example, glimpses from dwellings between the trees. There are two or three dwellings in Joshua Mews from which the quarry may be visible as the pit can be seen from a small section of the road reserve in the north. See Figure 2.

The pit may also be viewed from some rural land to the north east that contains several dwellings. Further away on the rural land it appears that remnant vegetation, landform and planted trees prevent the quarry from being seen, or minimise the view. See Figure 2.

4.5 What is the Status of Land from which the Quarry can be Seen?

The largest proportion of land from which the quarry can be seen is owned by Hanson. The adjoining land to the east is held by Midland Brick, a subsidiary of Boral Resources, which is itself subject to use as an Extractive Industry site.

The land within the viewshed has a range of zonings, but mainly “General Rural”, “Landscape” and “Special Rural” and even “Special Use for Extractive Industries and Landfill”.

However by far the most common zonings are sensitive, being “General Rural”, “Landscape” and “Special Rural” across the suburbs of Baskerville, Millendon, Herne Hill, and a small area in Brigadoon.

The quarry area and adjoining land owned by Midland Brick is zoned “Rural” and “Resource” to provide for continued rural land uses as well as protecting the extraction of basic raw materials.

The land in Daniel Place and Weir Road, Baskerville is covered by the Millendon/Brigadoon Locality of the Darling Range Regional Park proposal, (*Darling Range Regional Park, Ministry for Planning, October 1995*). This land has been classified as having high landscape protection and it is thus unlikely that any of this land will be permitted to be further subdivided. The land in Joshua Mews is not covered by the Darling Range Regional Park and this land provides restricted views of the quarry, particularly if trees are retained.

The Darling Range Regional Park proposal recognises that the land held by Hanson is required for basic raw materials. The Red Hill site is classified as Key Extraction Area 21/27 in State Planning Policy 2.4 Basic Raw Materials.

4.6 How has the Potential Visual Impact been Determined

Hanson have made significant efforts to minimise visual impacts. These are in place, are current, and will be utilised in the future. A summary of the actions taken is listed below.

- Computer analysis of the likely views by John Cleary Planning, and Allerding and Associates. These were generated for the land north of the powerline and provide a good representation of the potential visual impacts. See Figures 6 to 10. Note that the modelling is worse than the field situation.
- Using the Allerding Model to scroll around the whole operation from distances of up to 6 km, and further to determine the locations from which the public may be able to see the faces of the West Quarry Extension A and stockpile area.
- On ground analysis by Hanson staff, Hanson geological staff and Landform Research to determine which parts of the pit may be visible and when. See Figure 11.
- Comparisons between the actual field and computer generated views. See Figures 6 to 10.
- Taking sight lines from strategic locations to the north and north west from which the pit may be visible, and plotting the trajectory to determine which benches/faces may be visible, from where and when. See Figure 4. This provides data on the benches and faces that will be seen and when that view might occur. Notice that the face becomes more visible as the pit is extended, providing time for rehabilitation of the upper benches.

The sight lines with potentially the greatest view have been plotted onto the pit design (See Figure 5) to provide data to assist staging of excavation and rehabilitation. Sightlines similar to Figure 4 were used to generate the limit of visual impact in Figure 5.

- Field assessment from the West Quarry Extension A footprint sighting back to the sensitive premises and stockpile area. See Figure 11.
- Use of annual photographic records since 1998 from strategic viewpoints including locations within the community. See Figure 7, 8 and 13.

- Examination of 3D aerial photography. See Figures 2 and 3.
- Computer modelling by Hanson geological staff to design the pit progress to minimise visual impact. See Figures 6 to 10.
- Examination of the pit design and developing the design to stage the excavation to, where possible have the faces rehabilitated prior to exposure. See Figures 4 and 5.
- Drawing section lines and angles of view from the reference view sites to determine the elevation of the view of the faces and the likely timing of exposure of those faces for rehabilitation purposes. See Figures 2, 3 and 4.
- Letter dropping properties/residences within 6 km of the West Quarry Extension A, and stockpile area.
- Providing a public meeting and tour of the operations for interested residents on 21 November 2013.
- Discussions with the community forum of residents from Ministerial Statement 705.
- Examination of the annual reporting for the Screening and Rehabilitation Plan under Ministerial Statement 705.
- Reviewing the annual reporting produced since commencement in 1998 to review quarry progress and visual impacts.

The methods listed above are comprehensive and involve cross checking, such as between computer modelling, field examination and development of section lines.

Using the various methods and checks there is a high level of confidence that the visual impact has been well identified.

Once identified the visual impacts were then related back to the faces and pit design to develop the best methods of excavation, timing and rehabilitation to minimise the amount of bare face exposed at any one time.

The success of past rehabilitation has been extensively assessed over many years in the annual reporting as has the assessment of rehabilitation over the past two decades, to ensure the best methods of rehabilitation are provided.

5.0 STRATEGIES FOR SCREENING AND VISUAL IMPACT

Over the years Hanson has developed a number of actions and procedures to assist with managing visual impact at the Red Hill Quarry.

With the development of the rehabilitation program the return to local native species also assists with the management of biodiversity impacts.

Below is a summary of the procedures used by Hanson. See Figure 17.

- Developing strategies such as retention of land, retention of habitat, pit design, tree planting, rehabilitation and other methods to minimise impact. See Figures 2 and 12.
- Assessing the existing revegetation and utilising the same methods that work and modifying those that do not work. See Figures 12 to 15.
- Staging the excavation to allow for faces that may be visible to be rehabilitated prior to exposure where possible. See Figures 4 and 5.
- Planting strategic trees along the western and northern edges of the expanded pit areas.
- Planting a wide strategic wildlife corridor along the west at the Herne Hill Quarry site help compensate for clearing. See Figures 15A and 17.
- Selection of local species for rehabilitation, that are known to grow well, quickly and provide effective cover and create habitat. See Appendix 1 and Figure 13.
- Utilisation of overburden with a colour compatible with the landscape where possible. See Figures 13 and 14.
- Re-forming and planting earlier sub-standard rehabilitation.
- Use of APACE and Landform Research to select species for rehabilitation and APACE to conduct the rehabilitation.
- Use of Consultants (Strategen and Landform Research) to assess past rehabilitation with respect to growth rates, species, diversity, cover and visual management.
- Ongoing use of a consultant (Strategen) as an independent assessor of the ongoing success of visual management.
- Production of Annual Reports since prior to commissioning of the quarry (1998) by independent consultants (Landform Research and Strategen).
- Maintenance of an annual photographic record since 1998 from strategic viewpoints including locations within the community. See Figures 7, 13 and 15.
- Discussions with the community forum of residents from Ministerial Statement 705.

- Examination of the annual reporting for the Screening and Rehabilitation Plan under Ministerial Statement 705.
- Reviewing the annual reporting produced since commencement in 1998 to review quarry progress and visual impacts.

6.0 ON GROUND MANAGEMENT OF SCREENING AND VISUAL IMPACT

The landscape and local visual amenity is regarded as significant in a number of documents that are listed in the preceding section.

The main methods available to manage the local visual amenity in the past are listed below. The same methods have been very successful and will continue to be used for the West Quarry Extension Area A.

POSSIBLE MITIGATION	COMMENTS
Maintaining suitably large buffers.	<ul style="list-style-type: none"> • Hanson currently holds approximately 800 hectares of the surrounding land predominantly to the west and north. 235 hectares of buffer was sold to the Government for incorporation into the Darling Range Regional Park in 2003. • Statement 912 requires that within 5 years not less than 28 hectares of degraded area, consisting largely of the old Herne Hill processing and stockpile areas, will be rehabilitated using local provenance species. • See Figure 2.
Locating and designing the quarry to minimise visual impact.	<ul style="list-style-type: none"> • The design of the pit takes into account the nature of the resource and the local landscape. For example whilst it is possible to place the quarry on top of the ridge this may not be desirable because the ridge has very deep overburden which has to be removed to access the fresh rock. • This would create a much larger pit and would result in a large amount of overburden that will have to be removed and itself is likely to become a temporary visual issue when a dump is formed. • Care is taken in the design process to not sterilise resources or create problems where rehabilitation has to be removed or major future earthworks required which in themselves may create an unacceptable visual issue. • See Figures 2 and 17.
Locating the quarry behind a ridge	<ul style="list-style-type: none"> • When working on a north facing slope there is limited landform to locate the quarry behind. • The quarry is visually well protected from Toodyay Road, for example, but less visually well protected from the north and north west. • Locating the quarry on the northern side of Susannah Brook was less desirable because the quarry would have to be accessed from across Susannah Brook and the working faces would be much closer to the developed areas in Baskerville. • See Figures 2 and 17.

<p>Working as an inside out operation from the floor or benches of the pit.</p>	<ul style="list-style-type: none"> • The pit is always worked as an inside out operation, from the floor and internal benches. The only time that excavation works on the natural land surface is during land clearing which is addressed in Section 9.0 Rehabilitation Plan. • See Figures 4 and 5.
<p>Working behind vegetated landscape bunds</p>	<ul style="list-style-type: none"> • When working on a north facing slope it is often difficult to form a large enough bund to provide adequate screening to the north. The bund itself will form a temporary visual issue and there is limited landform to locate the quarry behind. • However, where possible, this is used and the current access road to the north west of the pit is constructed on a bund that provides visual protection to the lower benches of the quarry. • Bunds have been very successfully used to the south where a revegetated bund of 5 to 7 metres high has been constructed inside the property. This visually protects the processing area from Toodyay Road. • See Figures 8, 12 and 13.
<p>Rehabilitation of completed areas as soon as practicable.</p>	<ul style="list-style-type: none"> • Rehabilitation has always been completed as soon as possible. • The methods of rehabilitation are discussed in 9.0 Rehabilitation. • Since 1996 nearly 165 500 tube plants have been planted at the Red Hill site in addition to over 100 kg native seed (25 kg in 1997 alone). • See Figures 12 to 14.
<p>Use of natural coloured overburden</p>	<ul style="list-style-type: none"> • The upper rear quarry faces have been completed as soon as possible and rehabilitated by placing overburden on the benches and planting trees. • The overburden provides brown more natural colours than the grey fresh rock and assists visual management during the early growth of the revegetation. • See Figures 13 and 14.
<p>Rehabilitation of the upper rear quarry faces and overburden faces</p>	<ul style="list-style-type: none"> • The progress of the pit and the rehabilitation is timed where possible to try and not expose the faces until they have been rehabilitated. • This is not always possible and there is often a short time lag. • See Figures 4, 5 and 7.
<p>Painting of infrastructure.</p>	<ul style="list-style-type: none"> • All infrastructure is painted dark green to reduce reflections and better match the surrounding landscape. • See Figures 7 and 16A

Planting screening trees.	<ul style="list-style-type: none"> • Trees have been planted wherever possible. • Extensive planting took place in the first few years of operation along the Toodyay Road side of the operations and along the northern edges of the footprint. • A belt of trees has been planted along the western side of the Extension A footprint to lift the screening elevation of that side and provide better protection of the exposed rear face. • There are limitations in that there are only four local tree species on site and there is frequently very shallow soil that will not support trees. • The site is naturally covered by shrubs and not trees because of the shallow rocky nature of the soils. • See Figure 12.
Use of local native species	<ul style="list-style-type: none"> • Local native species (local provenance) are used, with APACE commissioned to collect seeds from site and germinate seedlings for planting as tube plants in the following winter planting season.
Use of curved access roads	<ul style="list-style-type: none"> • The access road from Toodyay Road has been curved to prevent a straight line of site into the crushing and processing area. • Other roads and features are located and designed to minimise visual impact.

Most of the above measures have been used. However at times compromises must be made.

For example the quarry can only be located where there is suitable resources of stone. The landform is out of the control of Hanson and whilst all efforts are made to use natural screening there are times when the pit may be visible from a particular location due to lack of full protection by the natural landform.

All methods are constantly under review and will be used as appropriate.

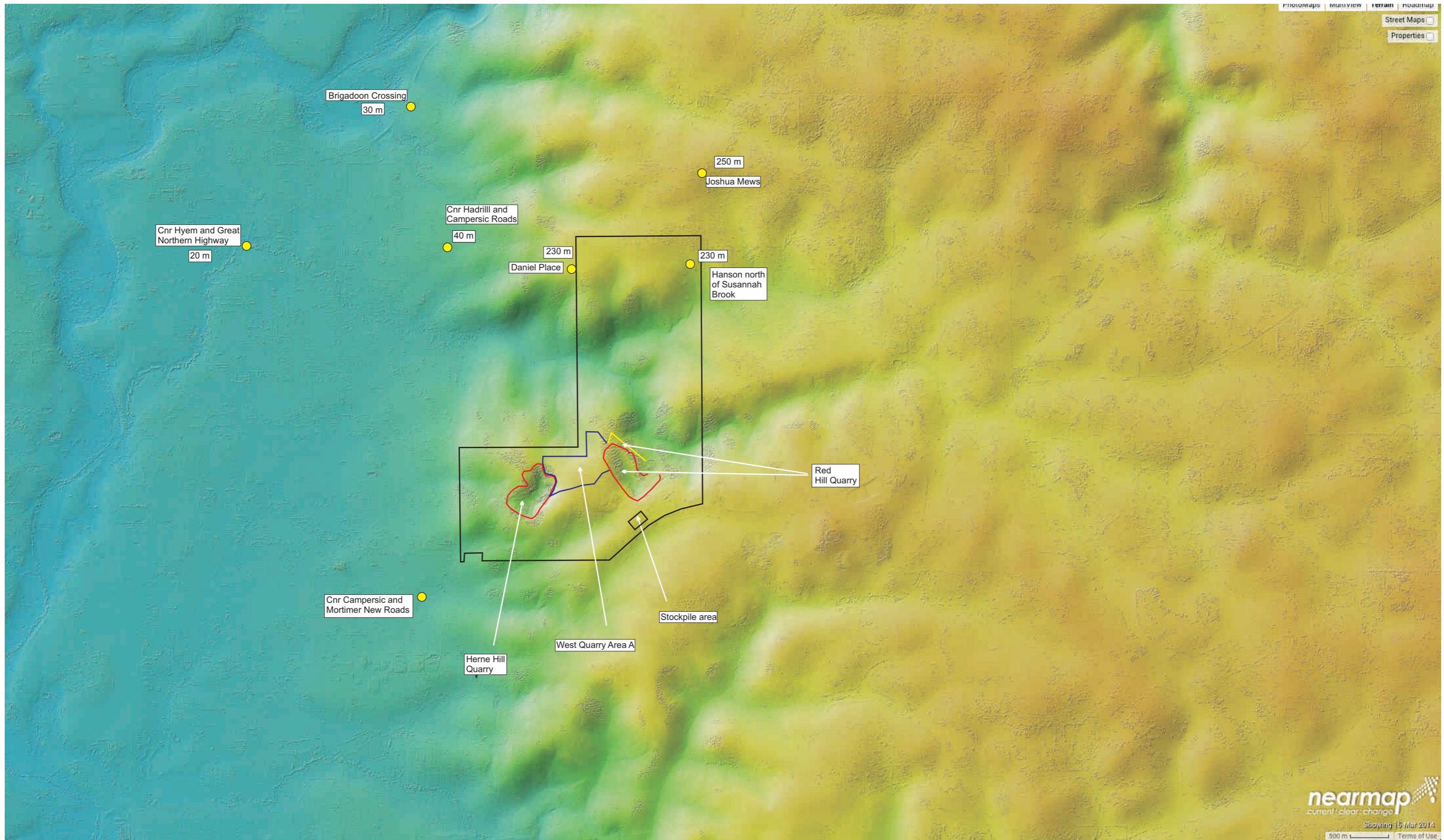
Visually sympathetic design of the pit, followed by a comprehensive Rehabilitation Program, has always been used and remains the best option for visual management both in the short and long term.

All land disturbed by the construction process, which is not immediately required, will be revegetated using techniques outlined in 9.0 Rehabilitation.

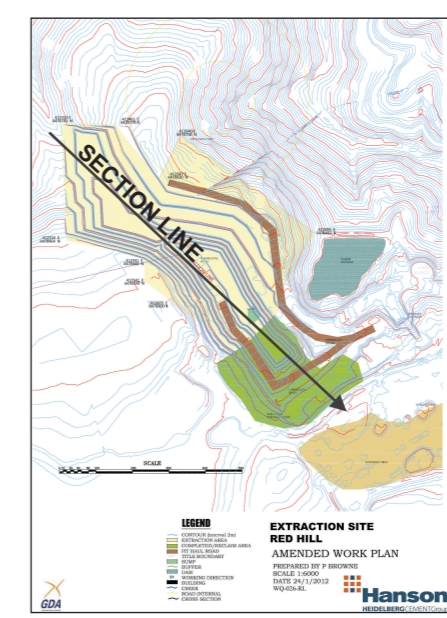
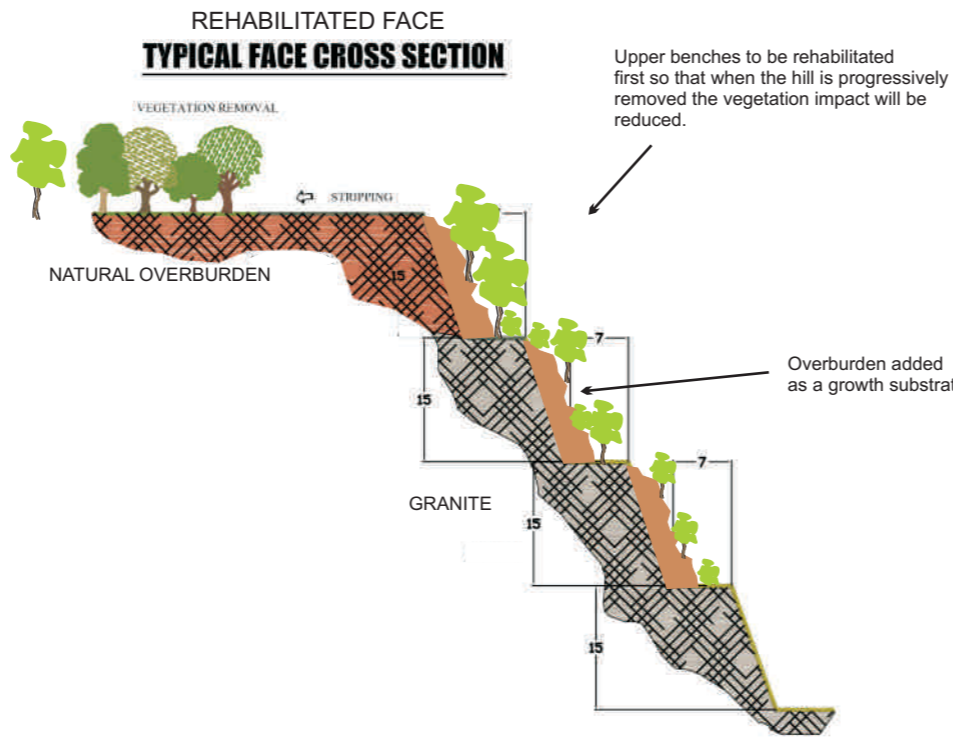
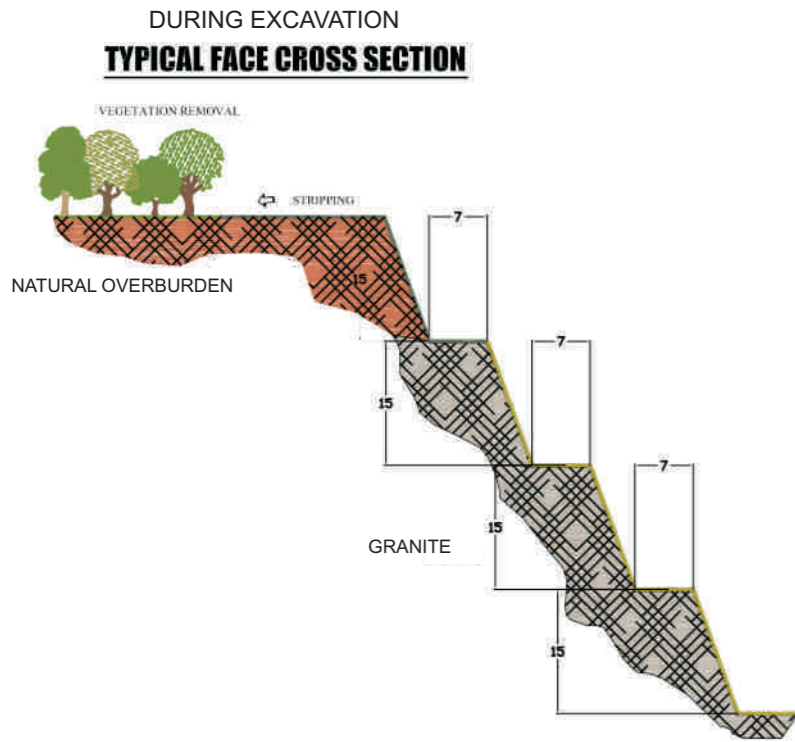
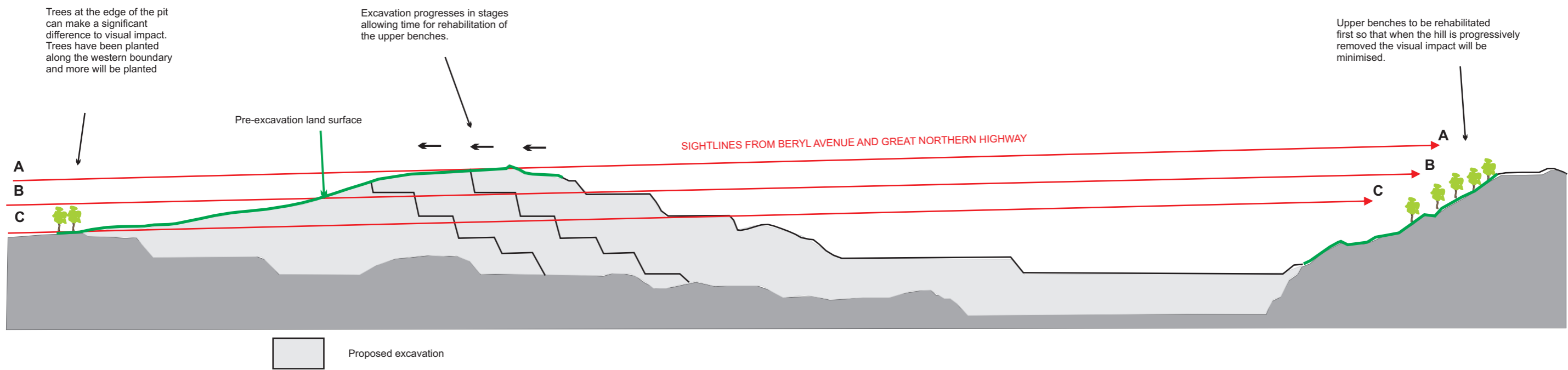
An assessment of the success of the past rehabilitation is attached as Appendix 1.



HANSON CONSTRUCTION MATERIALS RED HILL QUARRY AERIAL OVERVIEW	
Landform Research	March 2014
Baseplan Nearmap	Scale See Plan
FIGURE 2	



HANSON CONSTRUCTION MATERIALS RED HILL QUARRY	
DIGITAL ELEVATION MODEL	
Landform Research	March 2014
Baseplan Nearmap	Scale See Plan
FIGURE 3	



VIEWS OF THE REAR FACE

The elevation of the northern and western face influences how much of the active face is visible.

Staged excavation progressively exposes more of the rear face. Staged rehabilitation is proposed to minimise the amount of face that has not been rehabilitated, prior to exposure to view.

Trees on the near pit edge assist in reducing the visual impact and are to be retained, and added to in the north and west.

HANSON CONSTRUCTION MATERIALS RED HILL QUARRY SECTION LINE	
Landform Research	March 2014
Baseplan Nearmap	Scale See Plan
FIGURE 4	

METHODS OF STAGED REHABILITATION FROM THE TOP DOWN

**EXTRACTION SITE
RED HILL**

CROSS SECTIONS

PREPARED BY P BROWNE
SCALE 1:NTS
DATE 24/1/2012
WQ-025-RL