



Yara Development Envelope Archaeological Site Verifications, Burrup Peninsula, WA – Report

April 2020

Phil Czerwinski & Warren Fish

Client:
Yara Pilbara
Attention: Luke Blackburn
Manager – Public Affairs
luke.blackbourn@yara.com

Ownership and Disclaimer

The professional advice and opinions contained in this report are those of the consultants, Land Access Solutions Pty Ltd, and do not represent the opinions and policies of any third party.

This report and the contents are subject to copyright and may not be copied in whole or part without the written consent of the copyright holders, being Land Access Solutions Pty Ltd, Murujuga Aboriginal Corporation and Yara Fertilisers.

Land Access Solutions Pty Ltd is not responsible for omissions and inconsistencies that result from information that was not available at the time this report was prepared.

The professional advice and opinions contained in this report do not constitute legal advice.

Spatial Data

Spatial data captured for any archaeological site in this report has been obtained by using a hand held GPS unit using the GDA94 coordinate system.

Acknowledgements

Land Access Solutions acknowledges and thanks the following individuals who assisted in this project:

- Todd Griffin (Griffin Spatial & Mapping)
- Peter Jeffries (MAC).

Abbreviations

Abbreviation	Definition
ACMC	Aboriginal Cultural Material Committee
AHIS	Aboriginal Heritage Inquiry System
DPLH	Department of Planning, Lands and Heritage
GPS	Global Positioning System
LAS	Land Access Solutions Pty Ltd
MAC	Murujuga Aboriginal Corporation

Executive Summary

This report documents an archaeological site verification program for the Yara Fertilisers development envelope, Burrup Peninsula, WA. The fieldwork involved archaeologists and an anthropologist from Land Access Solutions. Representatives from the Murujuga Aboriginal Corporation were also consulted during the project.

The objective of the fieldwork was to identify and record all archaeological sites within the Yara development envelope.

During the archaeological site verification program all nine previously recorded Aboriginal heritage places within the Yara development envelope were assessed. Eight of these places were relocated, and revised boundaries, site information and photographs taken. One place could not be relocated, even though the peg that marks the place was still visible.

This report makes the following recommendations.

- Yara avoid all of the nine Aboriginal heritage places if possible.
- Yara quarantine the hills in the north-western corner of the lease from development.
- Yara engage Aboriginal monitors for initial earthworks.
- MAC Rangers are involved in monitoring of the heritage places. This will enable knowledge transfer to occur and ensure the heritage values are protected for future generations.
- Yara continue to consult with MAC to ensure heritage values are managed.

Contents

Contents	4
List of Figures	6
List of Tables.....	7
1 Introduction	8
1.1 Area.....	8
1.2 Brief	8
1.3 Participation.....	8
2 Aboriginal Heritage Act 1972.....	10
3 Area.....	11
3.1 Environment	11
3.2 Aboriginal Heritage	11
3.2.1 DPLH Aboriginal Heritage Inquiry System.....	11
3.2.2 Previous Surveys	11
4 Methods.....	14
4.1 Aboriginal Consultation – Methods	14
4.1.1 Pre-Fieldwork Consultation	14
4.1.2 Post-Fieldwork Consultation	14
4.2 Archaeological Fieldwork - Methods.....	15
4.2.1 Aboriginal Sites - Definitions.....	15
4.2.2 Archaeological Sites – Significance	15
5 Results	16
5.1 Archaeological Fieldwork - Results	16
5.1.1 Discussion.....	16
5.1.2 Management	16
5.2 Aboriginal Consultation - Results	17
5.2.1 MAC Office	17
5.2.2 Community Visits.....	17
6 Summary & Recommendations.....	19
6.1 Summary	19
6.2 Recommendations	19
7 References	20
8 Appendix 1: Spatial Data	21
9 Appendix 2: Site Information	22
9.1 9838 (Artefact Scatter)	22

**Yara Development Envelope Archaeological Site
Verifications, Burrup Peninsula, WA – Report**

9.2	18612 (Engraving).....	24
9.3	18613 (Quarry)	26
9.4	20264 (Grinding Patch)	28
9.5	20265 (Engraving).....	30
9.6	20266 (Engraving).....	32
9.7	20894 (Engraving).....	34
9.8	20895 (Engraving).....	37
9.9	20897 (Quarry)	40

List of Figures

Figure 1: Yara development envelope – area & results.....	9
Figure 2: 20894 – engraving of a map / ‘scorpion’.....	18
Figure 3: 20895 – engraving of a cultural design / ‘boomerang’	18
Figure 4: 9838 – view of site	23
Figure 5: 9838 – artefacts.....	23
Figure 6: 18612 – view of site	25
Figure 7: 18612 – original site photo	25
Figure 8: 18613 – view of site	27
Figure 9: 18613 – artefacts	27
Figure 10: 20264 – view of site.....	29
Figure 11: 20264 – grinding patch	29
Figure 12: 20265 – view of site.....	31
Figure 13: 20265 – engraving.....	31
Figure 14: 20266 – view of site peg	33
Figure 15: 20894 – view of site.....	35
Figure 16: 20894 – engraving 1	35
Figure 17: 20894 – engraving 2.....	36
Figure 18: 20894 – engraving 3.....	36
Figure 19: 20895 – view of site.....	38
Figure 20: 20895 – original site photo	38
Figure 21: 20895 – engraving 1	39
Figure 22: 20895 – engraving 2.....	39
Figure 23: 20897 – view of site.....	41
Figure 24: 20897 – artefacts	41

List of Tables

Table 1: Yara development envelope - details	8
Table 2: Yara development envelope - DPLH sites	13
Table 3: Yara development envelope - archaeological sites.....	16
Table 4: Yara development envelope – spatial data	21
Table 5: 9838 – site details	22
Table 6: 18612 – site details	24
Table 7: 18613 – site details	26
Table 8: 20264 – site details	28
Table 9: 20265 – site details	30
Table 10: 20266 – site details.....	32
Table 11: 20894 – site details.....	34
Table 12: 20895 – site details.....	37
Table 13: 20897 – site details.....	40

1 Introduction

Land Access Solutions (LAS) has been engaged by Yara Fertilisers (Yara) to complete an archaeological site verification program for the Yara development envelope, Burrup Peninsula, WA (Figure 1).

1.1 Area

The Yara development envelope consists of two land parcels totalling approximately 14km east-north-west of Karratha. It and is 23.47 hectares in size.

1.2 Brief

LAS were engaged to fulfil the following brief.

- In consultation with representatives from the Murujuga Aboriginal Corporation (MAC), undertake an archaeological site verification program of the Yara development envelope.
- Record the location, and describe the archaeological sites, within the Yara development envelope.
- If satisfied the archaeological material meets criteria under Section 5 of the AHA, clearly determine the extent of the site, and complete a recording of archaeological features, using a systematic method of site recording.

1.3 Participation

The fieldwork was completed over one fieldtrip (Table 1).

CONSULTATION & FIELDWORK DETAILS	
Fieldwork Dates	23-25/3/2020
MAC Consultants*	Tootsie Daniels
	Vince Adams
	Terry Dale
	Keith Churnside
	Jimmy Horace
Yara Representatives	Mark Bradley
LAS Archaeologists	Phil Czerwinski
	Warren Fish

* Due to the coronavirus pandemic, consultation was restricted (see Section 4.1 for details)

Table 1: Yara development envelope - details

Yara Development Envelope Archaeological Site
Verifications, Burrup Peninsula, WA – Report

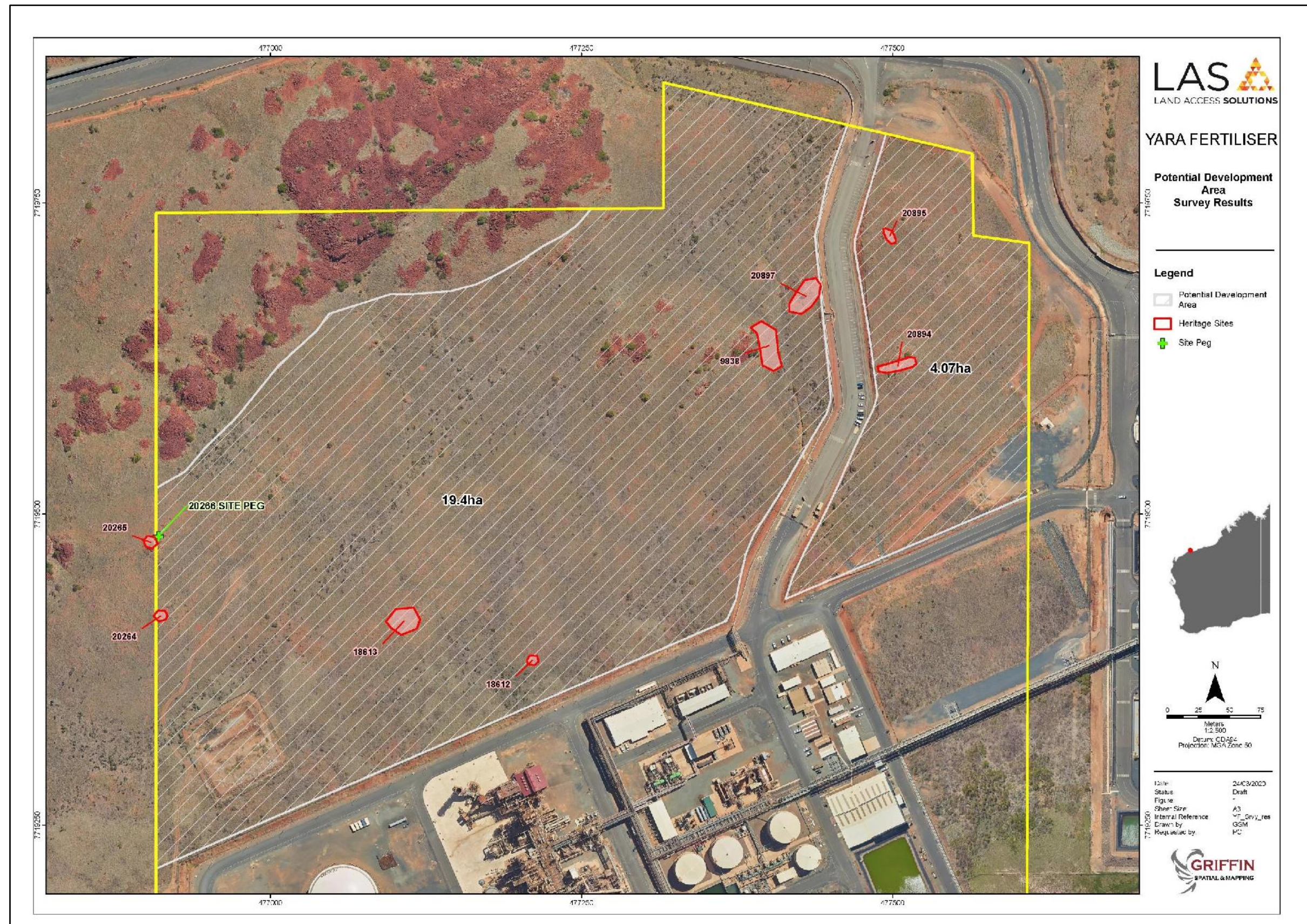


Figure 1: Yara development envelope – area & results

2 Aboriginal Heritage Act 1972

All Aboriginal Sites within Western Australia are protected under the *Aboriginal Heritage Act 1972* (AHA). An Aboriginal site is defined under Section 5 of the AHA. For archaeological sites, Section 5(a) & 5(c) have the most relevance.

(a) Any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of the Aboriginal people, past or present.

(c) Any place which, in the opinion of the Committee, is or was associated with the Aboriginal people and which is of historical, anthropological, archaeological or ethnographical interest and should be preserved because of its importance and significance to the cultural heritage of the State.

It is an offence under Section 17 of the AHA to excavate, destroy, damage, conceal or in any way alter any Aboriginal site without prior consent, under Section 18 of the AHA, from the Minister of Aboriginal Affairs. Penalties apply for breaches of the AHA.

For the administration of Section 18 of the AHA, the Aboriginal Cultural Materials Committee (ACMC) makes recommendations to the Minister of Aboriginal Affairs regarding whether a place meets criteria under Section 5 of the AHA and, where relevant, whether impacts to Aboriginal Sites should occur. The Minister of Aboriginal Affairs must be informed by these recommendations prior to granting or not granting consent to use the land where that use will impact Aboriginal Sites. Under Section 39(2&3) of the AHA, the ACMC use a set of standardised criteria in the evaluation of Aboriginal Sites.

For a full version of the AHA, refer to the following link: (http://www.austlii.edu.au/au/legis/wa/consol_act/aha1972164/).

3 Area

3.1 Environment

The Yara development envelope is located within the granophyre hills, hummocks and boulders of the Burrup Peninsula. The main vegetation in this area is spinifex grass, with occasional kurrajong trees growing amongst the granophyre outcrops. Creeks within the area are vegetated by numerous eucalyptus tree species and herbaceous plants.

3.2 Aboriginal Heritage

3.2.1 DPLH Aboriginal Heritage Inquiry System

A search of the Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System (AHIS) identified thirty-two previously recorded Aboriginal heritage places with boundaries overlapping the Yara development envelope (Table 2).

Of these thirty-two places, nine are Registered Sites (meaning the ACMC has assessed these as places to which the AHA applies), nineteen are Lodged (meaning the places are yet to be assessed by the ACMC), and three are Stored Data (meaning these places have been assessed as not being Aboriginal Sites under the AHA). One place (DPLH #23323) falls into none of these categories, and has the site status of "Contact DAA".

Desktop analysis of these previous site recordings identified eighteen of the thirty-two DPLH AHIS places have potential to be within the Yara development footprint. This is based on the fact that three of the places have been assessed as not Aboriginal Sites (#18611, #18614, & 18616), six of the places have been salvaged under a Section 18 consent under the AHA (#9635, #18611, #18614, #18616, #18617, & #21922), many of these places were recorded on other parts of the Burrup Peninsula (e.g. #23383, #23402, & 23763), and one covers the whole of the Burrup Peninsula (#23323) but has an unclear site status. Excluding the hills in the northwest of the Yara development envelope excludes a further nine DHPL AHIS places; leaving nine DPLH AHIS places to be verified during the current fieldwork.

3.2.2 Previous Surveys

Several archaeological and ethnographic surveys have been undertaken over the Yara development envelope. Two of these were broad scale regional archaeological studies of the Burrup Peninsula (DAS 1984, Vinnicombe 1997), while four reports are relevant to the Burrup (now Yara) Fertilisers plant (AIC 2001a, AIC 2001b, O'Connor 2001, Quartermaine 2003a, Quartermaine 2003b, and Quartermaine 2003c). The archaeological reports by Quartermaine relate to the salvage of six archaeological sites within the fertiliser plant and infrastructure corridor footprint.

**Yara Development Envelope Archaeological Site
Verifications, Burrup Peninsula, WA – Report**

DPLH SITE ID	SITE NAME	SITE STATUS	SITE TYPE	WITHIN YARA DEVELOPMENT ENVELOPE
9073	ROCK SHOT	Registered Site	Engraving, Other	NO
9215	HAUL ROAD SOUTH 06.	Registered Site	Artefacts / Scatter, Engraving, Grinding Patches / Grooves, Water Source, Other	NO
9635	FIRE QUARRY	Registered Site	Artefacts / Scatter	NO
9806	KING BAY EAST Q	Registered Site	Engraving, Man-Made Structure	NO
9807	KING BAY EAST R	Registered Site	Artefacts / Scatter, Engraving, Grinding Patches / Grooves, Man- Made Structure, Quarry	NO
9838	SMALL SITE	Lodged	Artefacts / Scatter	YES
18611	Burrup Fertiliser / Field Site 1	Stored Data	Artefacts / Scatter, Midden / Scatter	N/A
18612	DRD 130	Lodged	Engraving	YES
18613	DRD 134	Lodged	Artefacts / Scatter, Engraving, Quarry	YES
18614	DRD 135	Stored Data	Artefacts / Scatter	N/A
18616	DRD 138	Stored Data	Artefacts / Scatter	N/A
18617	BF/EFS 1 (relocated site)	Registered Site	Engraving	NO
19157	DRD 71	Lodged	Engraving, Other	NO
19230	DRD 131	Lodged	Engraving	NO
19232	DRD 133	Lodged	Engraving	NO
20264	Burrup Fertiliser Infrastructure Corridor 1	Lodged	Grinding Patches / Grooves	YES
20265	Burrup Fertiliser Infrastructure Corridor 2	Lodged	Engraving	YES
20266	Burrup Fertiliser Infrastructure Corridor 3	Lodged	Engraving	YES
20267	Burrup Fertiliser Infrastructure Corridor 4	Lodged	Engraving	NO

**Yara Development Envelope Archaeological Site
Verifications, Burrup Peninsula, WA – Report**

DPLH SITE ID	SITE NAME	SITE STATUS	SITE TYPE	WITHIN YARA DEVELOPMENT ENVELOPE
20269	Burrup Fertiliser Infrastructure Corridor 6	Lodged	Engraving	NO
20270	Burrup Fertiliser Infrastructure Corridor 7	Lodged	Engraving	NO
20271	Burrup Fertiliser Infrastructure Corridor 8	Lodged	Engraving	NO
20276	Burrup Fertiliser Infrastructure Corridor 13	Lodged	Grinding Patches / Grooves	NO
20894	BF / FS 03-1	Lodged	Engraving	YES
20895	BF / FS 03-2	Lodged	Engraving	YES
20896	BF / FS 03-3	Lodged	Engraving	NO
20897	BF / FS 03-4	Lodged	Quarry	YES
21922	BF/EFS 1 (Relocated 01/09/2003)	Lodged	Engraving	NO
23323	Burrup Peninsula, Murujuga	Contact DAA	Artefacts / Scatter, Ceremonial, Engraving, Fish Trap, Grinding Patches / Grooves, Historical, Man-Made Structure, Midden / Scatter, Modified Tree, Mythological, Quarry, Rockshelter, Skeletal Material / Burial, Arch Deposit, Camp, Hunting Place, Massacre	NO
23383	Woodside Pluto Area B 3	Registered Site	Man-Made Structure	NO
23402	Woodside Pluto Area B 22	Registered Site	Engraving	NO
23763	WGTO PB 138	Registered Site	Engraving	NO

Table 2: Yara development envelope - DPLH sites

4 Methods

4.1 Aboriginal Consultation – Methods

4.1.1 Pre-Fieldwork Consultation

Consultation about the site verification program was impacted by the Covid 19 pandemic, and the concern that the virus could be spread throughout the Aboriginal community by conducting consultations in a closed environment. This was a key determinant of MAC consultation methodology.

On 23 March 2018, MAC representatives Tootsie Daniels, Jimmy Horace, Vince Adams, Terry Dale, and Keith Churnside met with LAS archaeologists Warren Fish and Phil Czerwinski at the MAC office on the Burrup Peninsula. Concerns regarding potential virus transmission were raised and discussed, and it was agreed that requesting the Elders to conduct fieldwork under trying conditions was not ideal.

An overview of the site verification program was provided to the MAC representatives and it was decided that the LAS archaeologists would go in the field and verify all of the previously recorded sites. Pedestrian survey was seen to be redundant because the area had been surveyed numerous times in the past. The results of this fieldwork would then be brought back to the MAC representatives by way of a meeting once completed, and they would then have the opportunity to provide comment on the cultural aspects of the heritage sites, and present their views on the project in general. Individual sites could be visited if they presented particular issues or were of special significance.

4.1.2 Post-Fieldwork Consultation

During the archaeological fieldwork on 24 March 2020, a directive was given by Yara that no face to face meeting could be held between the relevant parties (these being MAC, Yara & LAS) due to social distancing measures. This meant that the planned post-fieldwork meeting was cancelled, and a work around was required to gain MAC representatives' views on the fieldwork results.

To overcome these obstacles, a strategy was developed where LAS would provide MAC with a presentation on the fieldwork results, and Vince Adams would then visit MAC representatives individually, present the material and record comment on the cultural aspects of the heritage sites. Mr Adams would then collate the viewpoints and provide feedback to Warren Fish.

The PowerPoint presentation to be circulated amongst MAC representatives was worked through with Vince Adams at the MAC office. Mark Bradley and Brian Howarth (Yara) were present. Mr Adams was comfortable with the information in the presentation and confirmed its adequacy in fulfilling the consultation process.

4.2 Archaeological Fieldwork - Methods

Prior to the fieldwork, the sites data was uploaded into handheld Garmin Global Positioning System (GPS) units for orientation in the field. Maps were printed to brief all participants. To verify the previously recorded sites, the previous site boundaries were uploaded into a handheld GPS unit for identification in the field. The DPLH site file for each site, and related survey reports, were reviewed to gain as much information about the place prior to the field inspection. Systematic coverage of the archaeological sites was then completed to ensure fulsome coverage within the site boundaries. Where the previous site boundary was spatially inaccurate, this was revised. Up to date site photos were then taken, and information about the intrasite components revised.

4.2.1 Aboriginal Sites - Definitions

For the purpose of this site verification program, and in keeping with legislative definitions and the LAS principals for recording Aboriginal Sites, an 'Aboriginal Site' is defined by LAS as follows.

A location with sufficient archaeological material, with adequate spatial context and environmental integrity, where it can unequivocally be demonstrated that techniques of Aboriginal hunter-gatherer subsistence technologies occurred at the location, and that the location is of "importance and significance" to further the knowledge of Aboriginal lifeways through archaeological investigation.

4.2.2 Archaeological Sites – Significance

Significance assessments are used to quantify whether an archaeological site has potential to provide information across a range of attributes accounting for scientific and/or social values. LAS assess archaeological significance as a spectrum of what attributes an archaeological site has that can contribute information to the understanding of past hunter-gatherer subsistence strategies, and also whether this significance has a contemporary context.

All archaeological sites recorded during the fieldwork are assigned a site significance based on the following considerations: Scientific Research Potential, Representativeness, Relatedness, Constituent Parts, Public Education Potential, Condition, Social Significance, and Aesthetic Value.

5 Results

5.1 Archaeological Fieldwork - Results

During the archaeological fieldwork all nine of the DPLH AHIS sites within the Yara development envelope were assessed (Table 3). Eight of these places were relocated, and revised boundaries, site information and photographs taken. One place could not be relocated, even though the peg that marks the place was still visible.

DPLH SITE ID	EASTING	NORTHING	SITE SIZE	SITE TYPE
9838	477399	7719635	42m x 16m	Artefact Scatter
18612	477211	7719383	9m x 8m	Engraving
18613	477107	7719414	25m x 20m	Quarry
20264	476912	7719418	10m x 9m	Grinding Patch
20265	476904	7719478	11m x 10m	Engraving
20266	476910	7719482	N/A	Engraving
20894	477504	7719620	33m x 8m	Engraving
20895	477498	7719723	14m x 7m	Engraving
20897	477430	7719675	33m x 17m	Quarry

Table 3: Yara development envelope - archaeological sites

5.1.1 Discussion

The archaeological sites within the Yara development envelope are all small and relatively modest based on known sites on the Burrup Peninsula (e.g. *Ngajarli* / Deep Gorge). The engraving sites contain a maximum of four motifs; none of which are outstanding examples of rock art when compared to other places with the same motifs. The artefact scatters and quarries are small, and do not have a wide variety of technological innovation for stone tool making.

5.1.2 Management

These archaeological sites should be managed in consultation with MAC. While the site boundaries of eight of the nine sites have been verified, there remains one site (#20266) that could not be located. This does not present a difficult management issue. 20266 is recorded as being on the same granophyre outcrop as #20265, and excising this outcrop from any development, along with having Aboriginal monitors present for earthworks, should protect any heritage values at this place.

Similarly, it is difficult to reconcile the exact locations of the reported three engravings recorded as being at #18613. Excising the granophyre outcrop the site is located on, plus having Aboriginal monitors on ground to monitor earthworks, should provide a way to ensure the heritage values of this place are managed.

5.2 Aboriginal Consultation - Results

As explained in Section 4.1, consultation with MAC was curtailed because of the COVID-19 pandemic. No site visits were held with MAC representatives; instead site information was provided to them as a presentation.

5.2.1 MAC Office

The PowerPoint presentation developed for this consultation was initially worked through with Vince Adams at the MAC office on 25 March 2020. Along with a general discussion about Aboriginal culture in the northwest WA, Adams provided some interesting insights into what the archaeology of the Yara development envelope means to him as an Aboriginal person. He was particularly articulate about the engravings, and how interpretation of individual motifs vary based on a person's world views. For example, the 'scorpion' recorded at site 20894 was a map (Figure 2), and how the 'boomerang' motifs are in fact related to designs painted on men's bodies during ceremonial activity (Figure 3).

Vince also viewed the spatial relationship of the archaeological sites as being a place where occupation was minimal, and that the area was not heavily used by Aboriginal people in the past, and was likely a place of temporary habitation where resources were gathered, and art made in an impromptu manner, as people travelled through the country to better watered and sheltered areas on Murujuga.

5.2.2 Community Visits

The post-fieldwork community consultation was completed by Vince Adams. Mr Adams travelled to the MAC representatives to meet them in person, and provided them with a copy of the PowerPoint presentation. The results of this consultation were unanimous and centred around the following:

- No rock art be relocated;
- Hills to the north-west of the lease not to be developed;
- Support for the project provided above two points taken into account; and
- Aboriginal monitors be present during ground disturbing activities.



Figure 2: 20894 – engraving of a map / 'scorpion'



Figure 3: 20895 – engraving of a cultural design / 'boomerang'

6 Summary & Recommendations

6.1 Summary

Desktop study of Aboriginal heritage survey reports has highlighted the Yara development envelope has previously been covered by numerous heritage surveys, both archaeological and ethnographic. Desktop analysis of the previously recorded DPLH Aboriginal heritage sites shows that, of potentially thirty-two sites, nine of these sites are located within the Yara development envelope. The site verification fieldwork relocated, remapped and updated site information for eight of these nine sites, with one site not being re-located. Consultation with MAC representatives acknowledged these sites as being of cultural importance, and should not be disturbed. Management options discussed with MAC representatives identified that excluding the sites from the development area, and having Aboriginal monitors engaged during initial earthworks provide the necessary tools to manage Aboriginal heritage values of the sites and the land.

6.2 Recommendations

This report makes the following recommendations.

- Yara avoid all of the nine Aboriginal heritage places if possible.
- Yara quarantine the hills in the north-western corner of the lease from development.
- Yara engage Aboriginal monitors for initial earthworks.
- MAC Rangers are involved in monitoring of the heritage places. This will enable knowledge transfer to occur and ensure the heritage values are protected for future generations.
- Yara continue to consult with MAC to ensure heritage values are managed.

7 References

Aboriginal Heritage Act 1972 Western Australia
(http://www.austlii.edu.au/au/legis/wa/consol_act/aha1972164/)

AIC 2001a *Consultation Regarding a s 18 Application under the Aboriginal Heritage Act (1972) of the proposed Ammonia Plant and Associated Infrastructure for Burrup Fertilisers Pty Ltd Volume 1 - The Yaburarra & Mardudhunera Representatives*. Report prepared for Wyeth & Associates Pty Ltd

AIC 2001b *Consultation Regarding a s 18 Application under the Aboriginal Heritage Act (1972) of the proposed Ammonia Plant and Associated Infrastructure for Burrup Fertilisers Pty Ltd Volume 1 - The Ngarluma Representatives*. Report prepared for Wyeth & Associates Pty Ltd

DAS 1984 *Dampier Archaeological Project. Survey and salvage of Aboriginal sites on portion of the Burrup Peninsula for Woodside Offshore Petroleum Pty Ltd. Catchment Areas, Geomorphic Zones and Tabulations*. Report prepared for Department of Aboriginal Sites, Western Australian Museum

O'Connor, R. 2001 *Burrup Fertilisers Ethnographic Survey Report*. Report prepared for Burrup Fertilisers

Quartermaine, G. 2003a *Interim Report on an Archaeological Salvage Project of Aboriginal Heritage Sites at Burrup Fertilisers Ammonia Plant Project Area Burrup Peninsula, Pilbara Region*. Report prepared for Wyeth & Associates Pty Ltd

Quartermaine, G. 2003b *Report on an Archaeological Salvage Programme Burrup Fertilisers Pty Ltd Plant Site Burrup Peninsula*. Report prepared for Wyeth & Associates Pty Ltd

Quartermaine, G. 2003c *Addendum to the Report on an Archaeological Salvage Programme Burrup Fertilisers Pty Ltd Plant Site Burrup Peninsula*. Report prepared for Wyeth & Associates Pty Ltd

Vinnicombe, P. 1997 *Maitland Heavy Industry Estate: Aboriginal Heritage Survey*. Report prepared for Department of Resources Development

8 Appendix 1: Spatial Data

All spatial data is provided electronically.

FILE NAME	DATA DESCRIPTION
YARA DE ARCHAEOLOGICAL SITE VERIFICATIONS	PowerPoint presentation provided to MAC for community consultation
YF__Artefact_location_mgazn50	Point data for Aboriginal site features
YF__Heritage_sites_mgazn50	Polygon data for Aboriginal site boundaries
YF__Peg_location_mgazn50	Point data for recorded location for #20266
YF__Potential_Dev_areas_mgazn50.shp	Polygon for Yara development envelope area

Table 4: Yara development envelope – spatial data

9 Appendix 2: Site Information

9.1 9838 (Artefact Scatter)

Site ID	Small Site
DPLH ID	9838
Site Type	Artefact Scatter
Easting (GDA94 – Zone 50)	477399
Northing (GDA94 – Zone 50)	7719635
Site Measurements	42m x 16m
Site Area	538m ²
Maximum Artefact Density	5/m ²
Estimated Artefact Count	~100
Site Significance	Scientific / Condition

Table 5: 9838 – site details

9.1.1.1 Site Environment

9838 is located on a flat rocky pavement on the eastern side of a granophyre knoll. The site is bounded to the west by this knoll, and to the east by a shallow creek line that runs in a north south direction. Vegetation is spinifex grass and sparse, small grevillea trees. Ground surface visibility at the time of recording was low at around 20%.

9.1.1.2 Site Description

9838 was originally recorded by DAS (1984) and described as a “*dispersed scatter of primary flakes and cores which extends over an area of approximately 20m long (N-S) and 1.5 – 3m wide*”. The site was subsequently verified by Quartermaine (2003b), who noted “*the site is registered as a small artefact scatter at the eastern end of a low hill near a small gully. The site was marked within an area of 25 by 5 metres*”.

9838 is an artefact scatter (Figures 4-5). It contains stone artefacts made from locally available coarse grained dolerite. Artefacts include flakes, cores and broken pieces. Artefacts are generally large in size, which is a reflection of the coarse grained nature of the rock the artefacts are made from. No tools were found at the site. The site represents a reduction area where Aboriginal people made stone flakes to be transported away for use elsewhere.

9.1.1.3 Site Significance

This place has archaeological significance relevant to scientific research merit and condition. The research potential of this site relates to the following analysis.

- Pilbara-wide Aboriginal settlement patterns.



Figure 4: 9838 – view of site



Figure 5: 9838 – artefacts

9.2 18612 (Engraving)

Site ID	DRD 130
DPLH ID	18612
Site Type	Engraving
Easting (GDA94 – Zone 50)	477211
Northing (GDA94 – Zone 50)	7719383
Site Measurements	9m x 8m
Site Area	56m ²
Engraving Count	1
Site Significance	Condition

Table 6: 18612 – site details

9.2.1.1 Site Environment

18612 is located on single boulder amongst a series of granophyre boulders. A shallow creek line runs to the west in a north south direction. Vegetation is spinifex grass and sparse, small grevillea trees. Ground surface visibility at the time of recording was excellent at around 90%.

9.2.1.2 Site Description

18612 was originally recorded by Vinnicombe (1997) as a single engraving. Quartermaine (2003b) subsequently recorded that “*this site is an engraving site on a low hill with outcropping rock*”, and that the site #18618 is a duplicate recording of 18612. Quartermaine (2003b) provides a photograph of the recorded place for this site, which was used to relocate the engraved boulder during the current fieldwork. The boulder recorded as this site had been pegged. Neither of the two previous recordings detail what the engraving is of.

18612 is an engraving site (Figures 6-7). It is difficult to determine what the engraving is of, since it is either very faint or a series of random / non-descript peckings.

9.2.1.3 Site Significance

This place has archaeological significance relevant to condition. The research potential of this site relates to the following analysis.

- Pilbara-wide Aboriginal settlement patterns.



Figure 6: 18612 – view of site



Figure 7: 18612 – original site photo

9.3 18613 (Quarry)

Site ID	DRD 134
DPLH ID	18613
Site Type	Quarry
Easting (GDA94 – Zone 50)	477107
Northing (GDA94 – Zone 50)	7719414
Site Measurements	25m x 20m
Site Area	410m ²
Maximum Artefact Density	8/m ²
Estimated Artefact Count	~50
Site Significance	Scientific / Condition

Table 7: 18613 – site details

9.3.1.1 Site Environment

18613 is located on a low granophyre outcrop. A shallow creek line runs to the west of this outcrop in a north south direction. Vegetation is spinifex grass and sparse, small grevillea trees. Ground surface visibility at the time of recording was excellent at around 90%.

9.3.1.2 Site Description

18613 was originally recorded by Vinnicombe (1997) as containing three engravings, a quarry site and associated artefact scatter. Quartermaine (2003b) subsequently recorded that *“this site is an archaeological site containing engravings, quarry and artefact scatter. It is situated on the rocky top of a low hill approximately 80m north-west of DIA id 18612. Site dimensions are 40 by 30 metres”*. Quartermaine (2003b) provides a photograph of the recorded place for this site, which was used to relocate the site during the current fieldwork. Neither of the two previous recordings detail what the engravings are of.

18613 is a quarry site (Figures 8-9). The three engravings reportedly at this site were extensively searched for, but no engravings could be located within the DPLH site boundary for this place. The quarry and associated artefact scatter consists of granophyre boulders that have been used as cores, and have had large flakes removed. Artefacts include cores, flakes and broken pieces. No tools were found at the site. Whether the large flakes struck off the boulder cores were subsequently used as cores to produce smaller, more useable flakes for tools is likely.

9.3.1.3 Site Significance

This place has archaeological significance relevant to scientific research merit and condition. The research potential of this site relates to the following analysis.

- Pilbara-wide Aboriginal settlement patterns.
- Pilbara-wide core reduction sequences.



Figure 8: 18613 – view of site



Figure 9: 18613 – artefacts

9.4 20264 (Grinding Patch)

Site ID	Burrup Fertiliser Infrastructure Corridor 1
DPLH ID	20264
Site Type	Grinding Patch
Easting (GDA94 – Zone 50)	476912
Northing (GDA94 – Zone 50)	7719418
Site Measurements	10m x 9m
Site Area	66m ²
Grinding Patch Count	1
Site Significance	Scientific / Condition

Table 8: 20264 – site details

9.4.1.1 Site Environment

20264 is located on single boulder amongst a series of granophyre boulders. Vegetation is spinifex grass and sparse, small grevillea trees. Ground surface visibility at the time of recording was excellent at around 90%.

9.4.1.2 Site Description

20264 was originally recorded by Quartermaine (DPLH site file 20264) as “*grinding patches... [located on a]...massive boulder or bedrock*”. The DPLH site file for 20264 provides a photograph of the recorded place for this site, which was used to relocate the boulder during the current fieldwork. This boulder, and another boulder nearby, had been pegged. An examination of the purported grinding patch, detailed by the photograph in the site file, identified this is not a grinding patch (the reported ground surface still retains an undulating surface at the micro level, and if used as a grinding surface these higher areas would have been bevelled off). Therefore the other pegged boulder with characteristics of being used as a grinding surface was recorded as the site location. This boulder is also closer to the location recorded for the site based on the DPLH AHIS.

20264 is a single grinding patch (Figures 10-11). It consists of a small ground surface on a flat section of a granophyre boulder. The grinding patch shows low-moderate abrasion from rock on rock rubbing, and was likely used as an opportunistic surface to grind seed such as those from spinifex grass.

9.4.1.3 Site Significance

This place has archaeological significance relevant to scientific research merit and condition. The research potential of this site relates to the following analysis.

- Pilbara-wide Aboriginal settlement patterns.



Figure 10: 20264 – view of site



Figure 11: 20264 – grinding patch

9.5 20265 (Engraving)

Site ID	Burrup Fertiliser Infrastructure Corridor 2
DPLH ID	20265
Site Type	Engraving
Easting (GDA94 – Zone 50)	476904
Northing (GDA94 – Zone 50)	7719478
Site Measurements	11m x 10m
Site Area	78m ²
Engraving Count	1
Site Significance	Scientific / Condition

Table 9: 20265 – site details

9.5.1.1 Site Environment

20265 is located on top of a moderate sized granophyre knoll. Vegetation is spinifex grass, a kurrajong tree growing out of the knoll, and sparse, small grevillea trees. Ground surface visibility at the time of recording was excellent at 100%.

9.5.1.2 Site Description

20265 was recorded by Quartermaine (DPLH site file 20265) as an “engraving: motif... [located on a]...small boulder”. The DPLH site file for 20265 provides a photograph of the recorded place for this site, which was used to relocate the boulder during the current fieldwork. The boulder recorded as this site had been pegged.

20265 is a single engraving (Figures 12-13). It is an irregular circle shape that has been deeply pecked into the boulder surface. There is a moderate level of re-patination over the engraving.

9.5.1.3 Site Significance

This place has archaeological significance relevant to scientific research merit and condition. The research potential of this site relates to the following analysis.

- Pilbara-wide Aboriginal settlement patterns.
- Aboriginal views on, and interpretation of, rock art.



Figure 12: 20265 – view of site



Figure 13: 20265 – engraving

9.6 20266 (Engraving)

Site ID	Burrup Fertiliser Infrastructure Corridor 3
DPLH ID	20266
Site Type	Engraving
Easting (GDA94 – Zone 50)	476910
Northing (GDA94 – Zone 50)	7719482
Site Measurements	0m x 0m
Site Area	0m ²
Engraving Count	0
Site Significance	N/A

Table 10: 20266 – site details

9.6.1.1 Site Environment

20266 is located on top of a moderate sized granophyre knoll. Vegetation is spinifex grass, a kurrajong tree growing out of the knoll, and sparse, small grevillea trees. Ground surface visibility at the time of recording was excellent at 100%.

9.6.1.2 Site Description

20266 was recorded by Quartermaine (DPLH site file 20266) as an “engraving: boomerang... [located on a]...fractured piece...1.5m west of site FS-02”. The DPLH site file for 20266 does not provides a photograph of the recorded place for this site, and based on the original recording notes no photograph was taken then. The boulder recorded as this site had been pegged (Figure 14).

The engraving reportedly at this site was extensively searched for, but no engravings could be located within the DPLH site boundary for this place.

9.6.1.3 Site Significance

Based on the current fieldwork this place does not contain any archaeological material. Therefore the place has no archaeological significance.



Figure 14: 20266 – view of site peg

9.7 20894 (Engraving)

Site ID	BF / FS 03-1
DPLH ID	20894
Site Type	Engraving
Easting (GDA94 – Zone 50)	477504
Northing (GDA94 – Zone 50)	7719620
Site Measurements	33m x 8m
Site Area	219m ²
Engraving Count	3
Site Significance	Scientific / Condition

Table 11: 20894 – site details

9.7.1.1 Site Environment

20894 is located amongst numerous granophyre boulders outcropping on a hilltop. Vegetation is spinifex grass and sparse, small grevillea trees. Ground surface visibility at the time of recording was moderate at around 70%.

9.7.1.2 Site Description

20894 was originally recorded by Quartermaine (2003c) as follows: *"This site is an engraving site consisting of two individual motifs on separate but adjoining boulders. They located on a low hill with outcropping rocks. The motifs are a boomerangs and a scorpion shaped engraving"*. Quartermaine (2003c) provides photographs of the recorded boulders at this site, which were used to relocate the boulders during the current fieldwork. The boulders had been pegged.

20894 is an engraving site (Figures 15-18). It contains the two previously recorded engravings, plus a bird track engraving on the same granophyre outcrop (this engraving is on the western side of the outcrop, whereas the other two engraved boulders are on the eastern side). All engravings have been pecked, with the bird track being abraded as well. Part of the 'boomerang' motif has disappeared when the rock on which it was executed has shattered, with this occurring prior to the previous site recording.

9.7.1.3 Site Significance

This place has archaeological significance relevant to scientific research merit and condition. The research potential of this site relates to the following analysis.

- Pilbara-wide Aboriginal settlement patterns.
- Aboriginal views on, and interpretation of, rock art.



Figure 15: 20894 – view of site



Figure 16: 20894 – engraving 1



Figure 17: 20894 – engraving 2



Figure 18: 20894 – engraving 3

9.8 20895 (Engraving)

Site ID	BF / FS 03-2
DPLH ID	20895
Site Type	Engraving
Easting (GDA94 – Zone 50)	477498
Northing (GDA94 – Zone 50)	7719723
Site Measurements	14m x 7m
Site Area	77m ²
Engraving Count	4
Site Significance	Scientific / Condition

Table 12: 20895 – site details

9.8.1.1 Site Environment

20895 is located amongst numerous granophyre boulders located on a hilltop. Vegetation is spinifex grass and sparse, small grevillea trees. Ground surface visibility at the time of recording was moderate at around 70%.

9.8.1.2 Site Description

20894 was originally recorded by Quartermaine (2003c) as follows: *"This site is an engraving site consisting of an individual motif on a granophyre boulder. It is located on a low hill with outcropping rocks. The motif is a boomerang shaped engraving"*. Quartermaine (2003c) provides a photograph of the recorded boulder at this site, which was used to relocate the boulder during the current fieldwork. The boulder had been pegged.

20894 is an engraving site (Figures 19-22). It contains the previously recorded 'boomerang' engraving, plus an engraved upright boulder containing three motifs: the top one appears to be a baby turtle, the middle one is a bird track, and the bottom engraving is an infilled circle. All engravings have been pecked.

9.8.1.3 Site Significance

This place has archaeological significance relevant to scientific research merit and condition. The research potential of this site relates to the following analysis.

- Pilbara-wide Aboriginal settlement patterns.
- Aboriginal views on, and interpretation of, rock art.



Figure 19: 20895 – view of site



Figure 20: 20895 – original site photo



Figure 21: 20895 – engraving 1



Figure 22: 20895 – engraving 2

9.9 20897 (Quarry)

Site ID	BF / FS 03-4
DPLH ID	20897
Site Type	Quarry
Easting (GDA94 – Zone 50)	477430
Northing (GDA94 – Zone 50)	7719675
Site Measurements	33m x 17m
Site Area	455m ²
Maximum Artefact Density	6/m ²
Estimated Artefact Count	~100
Site Significance	Scientific / Condition

Table 13: 20897 – site details

9.9.1.1 Site Environment

20897 is located on a large granophyre outcrop. A shallow creek line runs to the west of this outcrop in a north south direction. Vegetation is spinifex grass, a kurrajong tree growing out of the outcrop, and small grevillea trees. Ground surface visibility at the time of recording was excellent at 100%.

9.9.1.2 Site Description

20897 was originally recorded by Quartermaine (2003c) as follows: *"This site is a quarry and is situated 40 metres south-west of the registered site area on the west side of the access corridor. It covers an area of ten by twenty metres on a low granophyre outcrop (Plate 9). It contains a number of large cores and boulders with negative flake scars (Plate 10). Smaller cores and flakes were also noted"*. Quartermaine (2003c) provides photographs of this site, which were used to relocate the quarry during the current fieldwork.

20897 is a quarry site (Figures 23-24). The quarry consists of granophyre boulders that have been used as cores, and have had large flakes removed. Artefacts include cores, flakes and broken pieces. No tools were found at the site. Whether the large flakes struck off the boulder cores were subsequently used as cores to produce smaller, more useable flakes for tools is likely.

9.9.1.3 Site Significance

This place has archaeological significance relevant to scientific research merit and condition. The research potential of this site relates to the following analysis.

- Pilbara-wide Aboriginal settlement patterns.
- Pilbara-wide core reduction sequences.



Figure 23: 20897 – view of site



Figure 24: 20897 – artefacts