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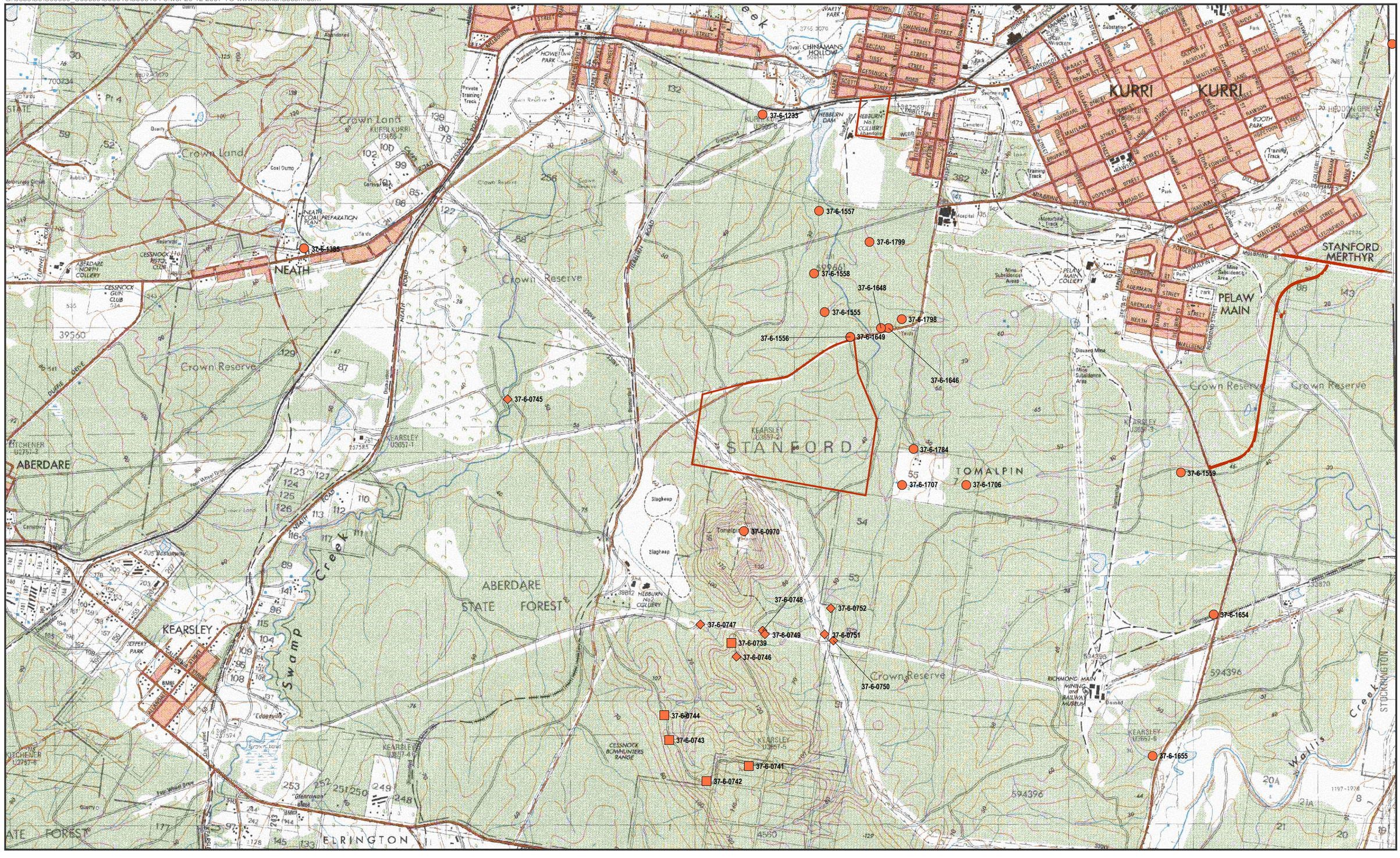

ENSR | AECOM

0 0.5 1km

Study Area
Isolated Find
None
Open Camp Site

Figure 3 **AHIMS Site Locations**

Valad Property Group

Aboriginal Heritage Assessment

HEZ Precinct 1

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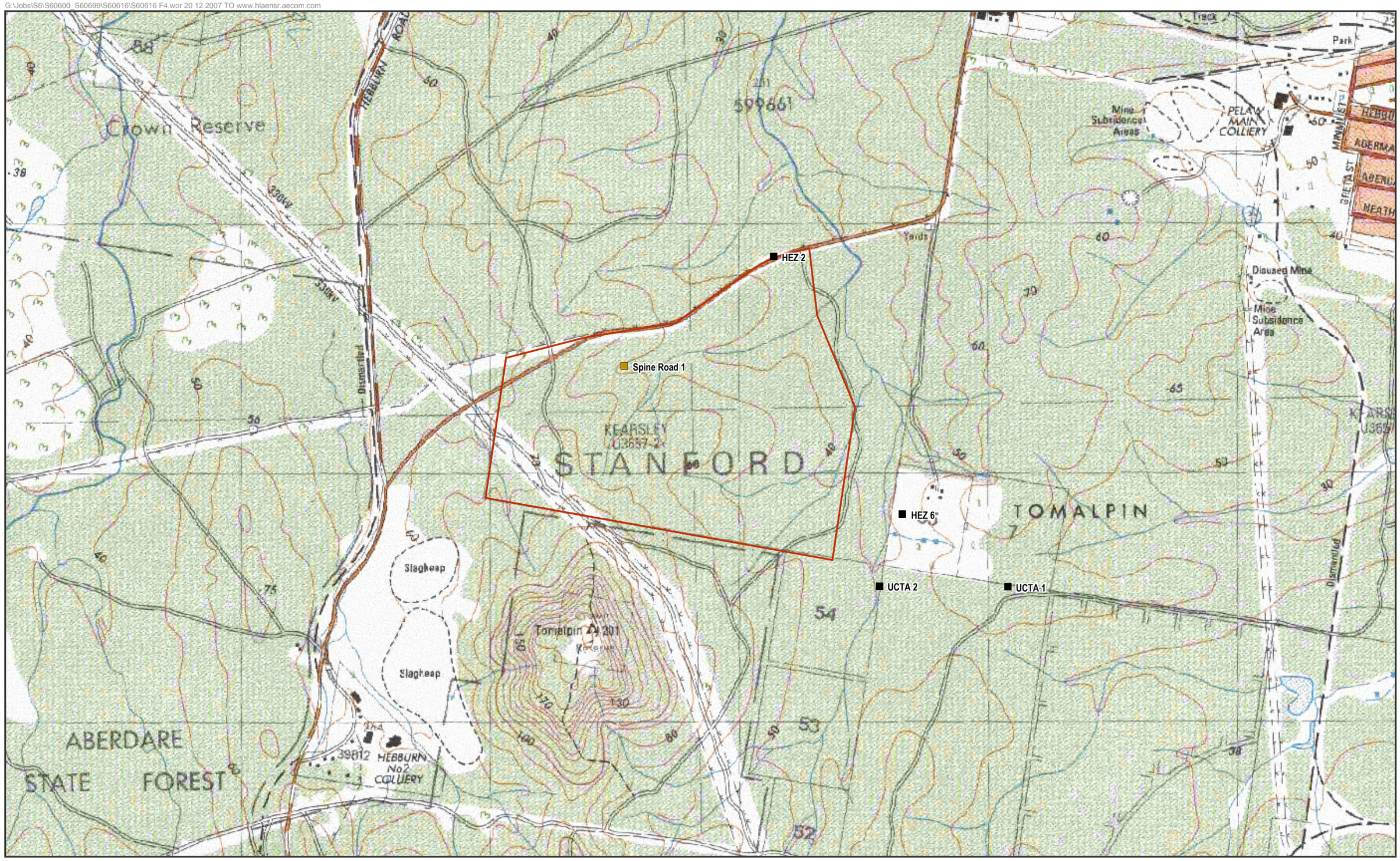

ENSR | AECOM

0 250 500m

Study Area

Aboriginal site found outside the study area

Aboriginal site found within the study area

Figure 4 **Aboriginal Sites Identified as Part of this Study**

Valad Property Group

Aboriginal Heritage Assessment

HEZ Precinct 1

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3.0 Legislative Context

3.1 Commonwealth Legislation

3.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Heritage Protection Act) is the principal Commonwealth legislation protecting Aboriginal heritage. The Act complements state/territory legislation and is intended to support state/territory laws and processes.

Under the Heritage Protection Act the responsible Minister can make temporary or long-term declarations to protect areas and objects of significance under threat of injury or desecration. The Heritage Protection Act also encourages heritage protection through mediated negotiation and agreement between land users, developers and Aboriginal people.

3.2 State Legislation

3.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act requires that consideration be given to environmental impacts as part of the land use planning process. In NSW environmental impacts are interpreted as including cultural heritage impact. Three parts of the EP&A Act are most relevant to Heritage. Part 3 relates to planning instruments including those at local and regional levels, Part 4 controls development assessment processes and Part 5 refers to approvals by determining authorities.

Importantly for this project, the NSW planning reforms have seen Part 3A introduced to the EP&A Act which provides a new approvals regime applying to all major projects. Major projects are defined under State Environmental Planning Policy (Major Projects) 2005 (SEPP 2005). It also applies to those projects which the Minister believes are required to deliver particular government plans or programs, known as critical infrastructure projects.

The new Part 3A applies to all projects where the Minister has the approval role. Under Part 3A, the Minister can issue a project approval or a concept approval. Both maintain the requirement for consultation with the community and relevant State Government agencies, however the requirement for certain other permits and licences is removed under Part 3A.

Section 75B(2) of the EP&A Act makes provision for 'major projects' to be identified through various means, including by way of declaration as a listed project in SEPP 2005, or by notice in the Gazette.

The proposed project is classified as a 'major project' under SEPP 2005 and the Minister for Planning is the approval authority.

Importantly for this study, under Section 75U (1) (d) of Part 3A, the proponent is not required to obtain certain permits under the NPW Act, specifically:

> *The following authorisations are not required for an approved project (and accordingly the provisions of any Act that prohibit an activity without such an authority do not apply):*
>
> > *(d) a permit under section 87 or a consent under section 90 of the National Parks and Wildlife Act 1974*

Instead of obtaining permits under the NPW Act, the proponent is required to prepare a **Statement of Commitments**, in accordance with the Director General's Environmental Assessment Requirements (EARs). Commitments of this report should be inserted into this Statement of Commitments.

3.2.2 National Parks and Wildlife Act 1974

Under the provisions of the NPW Act, Aboriginal archaeological sites are defined as Aboriginal "objects". Aboriginal object "means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains".

The most relevant section of the legislation is Section 90, which deals with the destruction of Aboriginal objects and is reproduced below.

> *Section 90 Destruction etc of Aboriginal objects or Aboriginal places*
>
> *A person who, without first obtaining the consent of the Director-General* [of DECC]*, knowingly destroys, defaces or damages, or knowingly causes or permits the destruction or defacement of or damage to, an Aboriginal object or Aboriginal place is guilty of an offence against this Act.*

Importantly for this study, the project is being undertaken under Part 3A of the EP&A Act, and as such does not require section 87 or section 90 permits (see **Section 3.2.1**). However, should Aboriginal objects or sites be located and require investigation or impact, a similar process should be outlined in the Statement of Commitments developed under this Act.

While consultation with the Aboriginal Communities is not required under the legislation, it is an integral part of the process and is outlined in more detail in **Section 4.2**.

4.0 Methodology

4.1 General

This archaeological assessment employed the following methods:

- review of DECC's AHIMS and Reports databases for the study area to identify Aboriginal archaeological sites / places that may be in the vicinity of the proposed development activities;
- review of the Register of National Estate and National Heritage Register for the study area and surrounding region to identify Aboriginal sites / places that may be in the vicinity of the proposed development;
- a literature review of the Aboriginal heritage of the area using primary and secondary sources identified through the AHIMS and other searches, including previous investigations;
- consultation with the relevant Aboriginal organisations for the area; and
- a site visit to identify known Aboriginal sites and any other heritage items that may be present within the proposed impact zone.

All archaeological sites identified during the field investigation would be recorded using a hand held GPS, digital photography, sketches and a written description.

4.2 Aboriginal Community Consultation

DECC developed the *Interim Community Consultation Requirements* (2004) in response to a number of Land and Environment Court (LEC) rulings. These guidelines establish a series of steps and timeframes for identifying Aboriginal parties, providing them with project information and consulting with them on methodology, assessment and recommendations.

As required by the DECC (2005) *Guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (with reference to Part 3A of the *Environmental Planning and Assessment Act, 1979*), HLA ENSR followed these guidelines, specifically HLA ENSR undertook the following steps with regard to this project:

- contacted the DECC's Executive Director Operations to seek advice on the relevant Aboriginal stakeholders;
- contacted the Minaribba Local Aboriginal Land Council (LALC) to identify their interest in the project;
- searched the Native Title Tribunal to identify possible Native Title holders;
- searched the Office or Registrar of Aboriginal Corporations; and
- advertised the project in the *Maitland Mercury* on 20 November to 4 December 2007, a period of ten working days.

A response was received from DECC in late November 2007, and all groups outlined in this document were informed of the project and provided a methodology. A newspaper advert was also run during this time seeking interest. Searches of the Native Title Tribunal and Office of Registrar provided no information regarding relevant Aboriginal groups in the area.

Following the registration period, three Aboriginal organisations registered their interest in the project, Mindaribba LALC (Rick Griffith), Barkuma Neighbourhood Inc. (Annie Hickey), and Ungooroo Community Association (Rhonda Ward). A further registration of interest was made by Lower Wonnarua Tribal Council (Lee-Anne Ball) in mid December, towards the end of the study. All of these groups were provided a copy of the proposed methodology during the registration period.

Following the completion of the registration and methodology periods, a field investigation was undertaken on 4 and 5 December 2007. The Mindaribba LALC (Steve Talbott, Christine Dever) and Barkuma Neighbourhood Inc (Annie Hickey) participated in the field investigation.

Aboriginal perspectives upon the project were obtained during the field investigation, and will be ongoing during the finalisation of this report. A consultation log and all correspondence received from the Aboriginal communities is included in **Appendix B** of this document.

4.3 Review of Existing Information

As required in the DECC guidelines, this report includes a desktop review of available information in respect of the existing environment, including a review of aerial photography and previous reports prepared for the area. In addition, a search of the DECC's AHIMS database for the area in question was undertaken.

4.4 Physical Inspection

The aim of the field survey was to ascertain whether the proposed development would impact upon either previously identified or unrecorded Aboriginal heritage sites. The survey encompassed a representative sample of Precinct 1 and the entire areas in relation to the Pelaw Main Bypass and the Station Road extension within five pedestrian transects (**Figure 2**). In relation to Precinct 1, three transects were undertaken encompassing the roads (due to the high visibility), creek lines and other landforms of interest, and typically ran in a north-south orientation. A single 2 km long transect from Leggetts Drive to John Renshaw Drive was undertaken for the Pelaw Main Bypass, while a further 200m long transect was undertaken encompassing the Station Road extension – between Scott Road to *Transmission Line Road* link road. Each transect consisted of four people walking in straight lines, some 40 m wide, but of various lengths.

All landform features, areas of interest and archaeological sites identified during the field investigation were recorded using a hand held GPS, digital photography, sketches and a written description. The transects, visibility conditions and results are presented in the effective coverage table in **Section 5**, which is compiled in accordance with DECC requirements (NPWS 1997).

4.5 Assessment of Archaeological Potential

An assessment of archaeological potential is a way of gauging, from available evidence, which sectors within a Study Area are more archaeologically "valuable" than others (where "value" is measured as the relative potential to provide information on past Aboriginal occupation or land use of an area). Assessment of sensitivity is made on the basis of:

1. the presence of known surface archaeological materials;
2. the probability of undetected surface archaeological materials;
3. the probability of subsurface archaeological materials; and
4. terrain nature and integrity. Information on pre-recorded sites and sites identified in this assessment is used in combination with observations of terrain nature and integrity to assess archaeological potential. Potential can be rated in terms of low, moderate or high, as shown in **Table 1**:

Table 1: Archaeological Potential

Rate of Archaeological Potential	Description of Area
Low	Archaeological material is unlikely to occur. This can be due to the landscape being unsuitable for human occupation, or to the landscape being heavily modified in recent history by European activity.
Moderate	Areas where archaeological materials may occur. Some indication of the natural soil profile or natural terrain remains, but where high site or artefact density is unlikely to occur.
High	Areas known or likely to contain archaeological materials. The terrain remains largely undisturbed, and sites are known to occur in this context in high concentrations or as a wide range of types.

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5.0 Existing Environment

5.1 Environmental Context

Investigations of the distribution of Aboriginal objects and places include an analysis of information on the natural resources available in a region to gain an understanding of the range of cultural remains that can be expected. Resources are linked to the hydrology, geology and soil types in a region.

Water availability is a major influence on the intensity of Aboriginal occupation and evidence, usually in the form of flaked stone artefacts, is often associated with permanent or semi-permanent water sources.

The availability of stone sources for artefact manufacture also influences the types and density of sites that may be encountered. Areas in which suitable stone raw materials are available often contain higher concentrations of flaked stone artefacts than regions where stone for artefact manufacture is scarce.

Soil types are influential as accumulating sediments can cover cultural remains while areas of sediment removal through erosion can either uncover buried archaeological material or transport small items away from the original depositional context. Soil analysis has important ramifications for archaeological research through the potential impact of different soils on human activity (such as agricultural exploitation) and the impact of the soils on archaeological evidence (such as post-depositional movement). The soils known to occur throughout the Study Area are identified here in order to delineate their nature and impact on the survival and location of archaeological material.

A detailed section on the archaeological and historical evidence of Kurri Kurri is also presented below to further interpret and analyse the spatial distribution and likelihood of archaeological material within the proposed Study Area.

Information on the geology and soil landscapes and topography in the region of the Study Area is presented below. These data were used in the development of the fieldwork methodology and discussion on the results of the field inspection at the end of this report.

5.1.1 Topography and Hydrology

The general location is the central lowlands of the NSW Hunter Valley. The subject area consists of a flat (associated with an off-site drainage line) and slope. The majority of the subject area could be described as slope landform (McDonald *et al*. 1998).

The western boundary of the subject area marks the commencement of a Conservation Zone established to preserve the important ecological and archaeological zone of Chinamans Hollow Creek. Chinamans Hollow Creek does not have an apparent flow of water during periods of low rainfall however ERM considered that the value of the Chinamans Hollow Creek landscape to the Indigenous inhabitants was its provision of relatively lush vegetation and the possibility of access to fresh water through digging in the sandy soil (ERM 2003).

5.1.2 Geology and Soils

The HEZ covers an area of approximately 871 ha with the geology and soils reflecting the Permian Branxton Formation of conglomerates, siltstones and sandstone. This area comprises the valley of Chinamans Hollow Creek, a ridgeline to its east with a series of low hills extending from the western boundary of the creek (Harper Somers O'Sullivan 2007). The flat, western side of Chinamans Hollow Creek is marked by aeolian sands first described following geomorphologic investigations (ERM 2003).

Based on ERM's (2003) investigation, the aeolian sands are considered of high archaeological interest, due to the presence of low concentrations of artefacts recovered within these types of sediments.

5.1.3 Vegetation

The area is almost entirely covered in forest which has been "pit propped" – sections of trees removed for mining shaft supports (ERM 2003). Coppiced trees are evident throughout the study area. The greatest extent of clearing is the main road that was under construction.

The predominant vegetation community within the study area is spotted gum-iron bark forest over most of the area with some patches of Kurri sand swamp woodland (ERM 2003). Several threatened plants occur in the Kurri Kurri area (Harper Somers O'Sullivan 2007).

5.2 History of the Study Area

5.2.1 Regional and European History

According to Horton (1994), the study area fell within the area of the Awabakal people (Horton 1994). It is probable that Aboriginal people had base camps along the Hunter River and its tributaries. The main tributaries near the study area being Wallis creek to the southeast and Swamp Creek to the west. (Roberts 2003). Archaeological evidence is sparse for most of this period, with dated evidence for Pleistocene occupation in the region from Moffats Swamp in the Newcastle Bight Inner Barrier (Baker 1994 cited in ERM 2003). The vast majority of archaeological evidence is associated with a specialised stone artefact technology associated with backed artefacts. This technology first appears in the archaeological record at around 8,000 years (Hiscock and Atttenbrow 1998) but occurs in abundance around the mid-Holocene. All but a very few open sites are characterised by backed artefact technology and thus date form the period after stabilisation of the sea to present levels. Sites without backed artefact technology include Moffats Swamp, Galloping Swamp and Newcastle Convict Lumberyard site (near Newcastle Railway Station)(ERM 2003). By 1836 a smallpox epidemic and other introduced diseases had decimated the Aboriginal population in the area (Roberts 2003).

The study area crosses several individual properties, which have been used for a variety of purposes including agricultural and logging. The surrounding area has been used extensively in the past for mining purposes. Evidence of associated mining infrastructure is still apparent today (Harper Somers O'Sullivan 2003).

5.3 Archaeological Context

5.3.1 Regional Archaeological Studies

A number of surveys and test excavations have been carried out in the vicinity of the HEZ study region. The studies indicate that surface exposures observed during archaeological surveys occasionally reveal low numbers of artefacts in landforms close to watercourses. Studies in the Vicinity of the HEZ Area include Brayshaw (1981, 1982, 1984), Djekic (1984), McIntyre (1984), Koettig (1990), Rich (1990), Stuart (1994), Griffiths (1995), Mills (1999), and Umwelt (2002). Of these studies Brayshaw (1981) and Unwelt (2002) observed 1 artefact each, with Djekic (1984) identifying five sites consisting of Aboriginal stone artefacts on a survey form Kurri Kurri. The differing results and observation between these surveys represent a number of factors which include

- surface visibility and exposure
- alterations to the environment from mining, industrial and residential land use; and,
- proximity to water and geomorphology.

Umwelt (2002) noted that surface visibility and previous land use limited the opportunity of identifying Aboriginal artefacts. Activities that had affected the study area included the old Abedare mine, rabbit

burrows, rubbish form the Cessnock Council rubbish dump that was located adjacent to the study area, cement footings and debris, and an old gravel road to the west and north of the study area (Umwelt 2002 cited in ERM 2003). Stuart (1994) also identified large amounts of rubbish that had been dumped within his study area. Other surveys have not identified Aboriginal artefacts, probably due in some part to lack of surface visibility and exposure. Within Cessnock State Forest, McIntyre (1984) attributed the fact that no artefacts were identified during survey work to a lack of deep topsoil, activity in the historic period and a lack of permanent water within 1 km of the survey. Griffiths (1995:12) notes the affects of surface visibility on the identification of Aboriginal artefacts during his survey:

> *'Ground visibility plays a major role when looking for Aboriginal occupational materials, as they are often found or exposed by natural erosion, or by ground disturbances caused by animal tracks, vehicle tracts or graded dirt roads'.*

Archaeological investigations directly relevant to the present study area were conducted by Kinhill (1995), Silcox (1999) Roberts (2002, 2004, 2005). The outcomes were the results of pedestrian based surveys informed by previous assessment of site predictability (Harper Somers O'Sullivan 2007). The Silcox and Roberts studies were conducted specifically for assessment of the HEZ development (ERM 2003). The Kinhill study identified nine sites including two isolated finds on the ridge and truncated tributary of Swamp Creek within Aberdare State Forest 1 km south of Mt Tomalpin. Silcox conducted a five day surface survey walking over vehicle tracks and identified sparse scatters on the read surface mostly within 300m of Swamp Creek (ERM 2003).

Silcox (1999) and Roberts (2002, 2004, 2005) did not locate any Aboriginal sites. ERM (2003) notes that both Silcox and Roberts failed to identify the occurrence of Aeolian sand and their archaeological sensitivity within the study area. Silcox recommended that development avoid the creek corridors and be limited to the watershed between Swamp Creek and Chinamans Hollow Creek, and the upper reaches of Chinamans Hollow Creek. Roberts repeated the results of Silcox and, to a large extent his recommendations (ERM 2003).

ERM (2003) conducted a study managed by Neville Baker, which was based on the results of test excavations on three landform areas deemed of archaeological potential by the then Department of Environment and Conservation (now DECC). A subsequent 2004 ERM report, also by Neville Baker in conjunction with geomorphologist, Phillip Hughes, was based on a geomorphological study to determine the extent of the archaeologically significant Aeolian ands associated with Chinamans Hollow Creek. The excavation found that archaeological evidence is all but totally absent in two of the three areas specified for salvage in the Brief. One Aboriginal stone artefact was discovered in excavations in the eastern tributary area and no artefacts were found in excavations on the ridge. Significant archaeological deposits within deep aeolian sand were discovered on the western side of Chinamans Hollow Creek between the "Transmission Line Track" and Hebburn Dam.

Recommended by ERM (2003) was an Aboriginal heritage conservation area in the northern confluence area of Chinamans Hollow Creek, between the "Hospital Track" and Hebburn Dam. The conservation area would expand on the existing riparian conservation area and ensure protection of the most significant part of an extensive archaeological deposit.

According to Harper Somers O'Sullivan (2007) HEZ has been subjected to six cultural heritage surveys. In the area proposed for development by UCTA , three artefacts were identified which were identified as UCTA 1 (2 artefacts) and UCTA 2 (1 artefact). No other sites were identified during the other five surveys (Harper Somers O'Sullivan 2007).

5.3.2 Previously Recorded Sites

HLA ENSR undertook a site search of the Study Area and its surrounds (10 km^2), using the DECC AHIMS on 27 November 2007. The search investigated and identified 31 previously documented sites are recorded in or near the study area (**Figure 3**).

Of the 31 sites overall, they can be broken down as follows:

- isolated finds = 5;
- open camp site (artefact scatters) = ;8
- undefined site = 18 (while the site types were omitted in relation to these sites, the specific AHIMS codes suggest they were dominated by a mixture of scarred/carved trees and/or artefactual in nature).

Four of these sites are located within close proximity to Precinct 1, HEZ 2, HEZ 6, UTCA 1 and UTCA 2. HEZ 2 and 6 were identified by ERM 2003. HEZ 2 was located to the north of *Transmission Line Road* and consisted of an isolated silcrete core. HEZ 6 was located to the southeast of Precinct 1, near the Spine Road, and consisted of.

UTCA 1 and 2 are isolated finds, both located on the *Transmission Line Road* to the north and east of Precinct 1 (Harpers Somers O'Sullivan 2007). Due to the current management of these sites by Harper Somers O'Sullivan, HLA ENSR did not re-investigate or consider these sites in this study to avoid potentially conflicting advice.

5.3.3 Archaeological Synthesis

Based on previous studies within the area and the AHIMS search of a 10km x 10km grid surrounding the Study
Area, a number of factors can be identified when considering archaeological site distribution, specifically:

- that surface visibility and previous land use limited the opportunity of identifying Aboriginal artefacts;
- the archaeological record in this area is dominated by undefined artefact sites and isolated finds. Raw materials within these sites are usually dominated by mudstone/tuff with lesser components of silcrete and very occasionally quartz and quartzite;
- several studies note that site distribution is dominated by the presence of extensive and/or permanent water resources. Hence, areas surrounding Swamp creek and other creek lines are considered likely locations for archaeological site occurrence;
- excavations within the HEZ by ERM (2003) identify the importance of the aeolian sand units, most notably near Chinaman's Creek, for the location of Aboriginal objects/sites;
- several studies have found that existing activities, specifically mining, can have a large negative effect in site identification of preservation; and
- a search of the AHIMS register revealed 31 sites within ^{5km} of the Study Area, four of which are located in the immediate vicinity of Precinct 1 – HEZ 2, HEZ 6, UTCA 1, and UTCA 2. All of these sites are isolated finds or low concentration artefact scatters.

6.0 Results of Field Investigation

This section presents information on the transects investigated as part of this study (**Figure 2**), and any archaeological sites identified (**Figure 4**).

As outlined in **Section 4.4**, the investigation was carried out in five transects (**Plates 1** to **9** inclusive), which encompassed a representative proportion of Precinct 1, and the entire areas relating to the proposed Pelaw Main Bypass and Station Road extension Descriptions of each of the five transects investigated and their effective coverage are presented in **Table 2**.

However, in general the Study Area consists of densely vegetated undulating hills and slopes with numerous first order drainage lines. The Study Area is relatively undeveloped, with only the Spine Road, several unsealed roads and tracks, and other minor infrastructure (including a large 330kV transmission corridor and a Hunter Water Corporation Reservoir site) being present. Although, it should be noted that two areas - to the east of the Spine Road and the *Transmission Line Road* – were undergoing significant development during the physical inspection.

The transects were dominated by dense Eucalypt woodland with an understorey of *Acacia* and *Hakea* sp. shrubs with numerous low lying grasses. Occasional *Melaleuca sp.* and *Angophoras* were also present. A dense leaf litter across much of the Study Area further inhibited effective coverage. Where soil profile's were identified, most notably in some of the eroding drainage lines in transects 2 and 3, and along the transmission corridor in transect 1, they exhibited a shallow duplex soil encompassing a dark sandy topsoil (10 to 30 cm) overlying orange/red clays and/or sandstone bedrock. No areas retaining sand or sand units were identified during the physical inspection.

Key aims of the physical inspection were to identify any well defined creeks and/or sand-sheet type deposits, both identified as areas of archaeological interest based on ERM's (2003) excavations of the area, as well as areas of previously documented Aboriginal objects/sites.

The Study Area did not identify any formed creek lines with all of the drainage lines identified during the physical inspection being open depressions or low points in the undulating slopes, rather than channellised creek lines. The physical inspection did not identify any aeolian sand sheet deposits either.

In relation to coverage, overall the study investigated some 174 000 m^2 (17.4) for the Study Area, with an average exposure (i.e. clear ground) of 15% and an average visibility of these areas of 20%, which provides an overall effective coverage of 4% - a low but typical value for this type of investigation. Dense vegetation and leaf litter limited effective inspection of the area to occasional exposures and the numerous unsealed tracks occurring throughout the Study Area.

However, while the effective coverage of the Study Area was very low, the investigation did not identify any areas of sand-sheets or extensive creek lines, both of which are key factors in Aboriginal site distribution within this region based on several previous studies. The physical inspection sought to focus upon the creek lines and low lying swamp areas within Precinct 1 and the Pelaw Main Bypass, but as outlined above, there was no clear definition or edges to these creeks, which were largely a focus of surface water in open depressions and low lying areas.

In relation to the Pelaw Main Bypass, the transect revealed an extensive area of low-lying wetlands and open depressions. Soil and vegetation in the area indicated regular and prolonged water-logging and flooding, and hence an unlikely location for Aboriginal objects/sites. Towards John Renshaw Drive, the land begins to rise, but was generally disturbed and, despite excellent visibility in this area, no Aboriginal objects/sites were identified.

In relation to the Station Road extension, the investigation revealed no Aboriginal objects/sites or potential sites. Transect 5, encompassing this area, revealed a heavily disturbed area, which had been previously mined for coal. Existing roads, paths and other infrastructure was also present within this Study Area.

Only one Aboriginal object was identified as part of the study, located on an eroding creek line near the north end of the Spine Road within transect 1.

Table 2: Transect Summary

Transect Number	Easting (MGA)	Northing (MGA)	Description	Transect area (m^2)	Visibility (%)	Exposure (%)	Effective Coverage % (m^2)
1	Start: 354837 To: 354342 To: 354477 End: 354646	6365805 6365718 6365085 6365607	Transect 1 encompasses the western section of Precinct 1, and is constrained by the Spine Road to the east, the transmission corridor to the west, the Hunter Water Corporation Reservoir Site to the south and the continuation of the *Transmission Line Road* to the north. The transect encompasses several unsealed tracks (**Plate 1**), mostly following the transmission corridor and providing access to the Hunter Water site. The transect retains undulating hills and slopes and a number of minor unformed drainage lines (**Plate 2**). Soils were composed of a mixture of shallow duplex soils, and truncated clays or bedrock – erosion along the unsealed roads being extensive. Vegetation within the transect consisted of generally young Eucalypt woodland with an extensive understorey of Acacia sp. shrubs, Banksia sp. shrubs and low lying grasses. Visibility and coverage was low.	48 000	15	15	1.5 (780)
2	Start: 354562 End: 354965	6365838 6365051	Transect 2 is located between the Spine Road and the *Transmission Line Road* – the latter being under construction at the time of the survey – and runs through the centre of Precinct 1. The transect is composed of undulating slopes and open depressions (drainage lines or erosion scours in places) and is covered in dense Eucalypt woodland (**Plates 3** and **4**). Similarly an understorey of Acacia sp., Hakea sp. and low lying grasses. The soil profile indicates a mixture of duplex soils with some evidence of colluvial movement of material down slope. Despite the dense vegetation and limited exposure, the transect revealed no areas likely to retain Aboriginal heritage, due to the absence of any significant landform	24 000	10	10	1 (240)

Transect Number	Easting (MGA)	Northing (MGA)	Description	Transect area (m^2)	Visibility (%)	Exposure (%)	Effective Coverage % (m^2)
			features or *in situ* soils. The transect also includes several modern impacts, including extensive earthworks adjacent the Spine Road, construction works and work areas adjacent the *Transmission Line Road*, and the development of the Spine Road (which has involved cutting and filling).				
3	Start: 355254 End: 355271	6364949 6366066	Transect 3 runs parallel and to the east of transect 2. The transect retains similar landform elements and features as transect 2, although the drainage lines within this transect are more established (**Plate 5**). However, the drainage lines are still basically erosion scours with no defined delineation. No sand sheets or units were identified surrounding these drainage lines (**Plate 6**).	36 000	10	10	1 (360)

Transect Number	Easting (MGA)	Northing (MGA)	Description	Transect area (m^2)	Visibility (%)	Exposure (%)	Effective Coverage % (m^2)
4	Start: 358285 End: 359013	6365019 6366736	Transect 4 is located between Leggetts Drive and John Renshaw Drive and encompasses a series of very gentle slopes and open depressions, raising into a moderate to steep slope to the north in the vicinity of Stanford Merthyr. The transect is characterised by two distinct ecotones split by an old coal road partway along the transect. To the south, near Leggetts Drive, the transect encompasses an open Melaleuca sp. woodland with low lying Spinifex type grasses. Exposure and visibility was relatively high in this area (**Plate 7**). To the north of the old coal road, the transect becomes more enclosed with a dense Eucalypt sp. woodland and Acacia sp. shrub land (**Plate 8**). Visibility is severely reduced in this area. The soils across the transect were a mixture of truncated and minimal duplex soils in the south, and dark waterlogged soils to the north. Vegetation and soils indicate that much of this transect is composed of low lying swamplands and soaks (several of which were found during the survey) (**Plates 7** and **8**). Towards the north of the transect, the land rises towards John Renshaw Drive, but despite good visibility in this area, no Aboriginal objects/sites were located.	60 000	15	15	1.5 (900)
5	Start:: 355807 End: 355710	6367900 6368039	Transect 5 is located opposite Station street and is adjacent the railway track to the north of HEZ (**Plate 9**). Scott street runs horizontally to Station street and the transect location. The transect encompasses existing roads and paths, and is situated over an old coal colliery. The transect is located on flat ground and is characterised by low lying grasses and weeds. The transect is completely artificial due to the previous mining in the region and has no potential for Aboriginal objects/sites to remain. Visibility and exposure, due to the unsealed tracks and cleared areas,	6 000	30	50	15 (900)

Transect Number	Easting (MGA)	Northing (MGA)	Description	Transect area (m^2)	Visibility (%)	Exposure (%)	Effective Coverage % (m^2)
			was good in this area.				
			Average	*34 800*	*16*	*20*	*4 (636)*
			Total	**174 000**			**3 180**

6.1 Sites Identified

Several previous sites are known to be present within or adjacent the Study Area, specifically HEZ 2, HEZ 6, and UTCA 1 and 2 (**Figure 3**). All of these sites were located upon the *Transmission Line Road*, which is currently being sealed. Based on their locations, and discussions with Valad, it is understood that these sites are currently being managed under a different study, and HLA ENSR personnel therefore did not re-investigate them further.

Only one Aboriginal site was identified as part of the physical inspection (**Plates 10** to **13** inclusive and **Figure 4**). The site has been identified as *Spine Road 1*.

Site: Spine Road 1

Site Type: Isolated Find

Location: .MGA 354646E, 6365607N

Description: The site consists of an isolated find located from disturbed soil which may have come from up the slope. Investigation of the potential upslope locations of this artefact revealed no further artefactual material. The isolated find was located on the northern edge of an eroding 1st order watercourse in the northwest corner of Precinct 1. The site is approximately 50 m west of the Spine Road (which is in a north-south orientation in this location) along a modified drainage line (**Plate 10**). The site is located just within the tree line, which is some distance from the road in this location. The site is on a disturbed context, the drainage line causing massive erosion in this area (much of which appears recent). The site should be considered a single surface find with no potential for subsurface deposits.

The isolated find is an early reduction stage silcrete core, measuring 55 mm x40mm by 12 deep (**Plate 10**). Two dorsal scars are located on either side of the artefact (**Plate 13**), with one being the platform for the other. Some platform preparation is also evident on one edge (**Plate 12**).

6.2 Sensitivity Rating

Zones of archaeological sensitivity can be delineated on the basis of this assessment of the probability of additional archaeological material occurring in the Study Area. This assessment relates to the probability of material occurring and does not address scientific significance or the cultural significance of the material to Aboriginal community members.

Based on the existing environment and the physical inspection, and with the exception of *Spine Road 1*, there are unlikely to be any archaeological sites within the Study Area. This conclusion has been reached through three main reasons, 1) the lack of extensive archaeological finds within the HEZ despite significant studies being undertaken, including excavations of a variety of landforms (ERM, 2003); 2) previous disturbance in the area, including coal mining, logging and recent HEZ development; and 3) the location of the Study Area is not in the vicinity of any likely Aboriginal resources (such as significant water), and is therefore unlikely to have been conducive for settlement or use historically.

In relation to *Spine Road 1*, the isolated find is considered of high archaeological sensitivity, due to its protection as an Aboriginal object under the NPW Act. However, the site is not considered to extend beyond the immediate vicinity of the Aboriginal object, and there is no potential for subsurface deposits.

Based on the evidence provided here, it seems likely that the Study Area can be considered as of low archaeological sensitivity.

6.3 Summary

- The Aboriginal history and archaeological record all reveal that Aboriginal people occupied and used the resources of the Kurri Kurri area. Site types are dominated by undefined sites, open camp sites (artefact scatters) and isolated finds.
- Based on excavations by ERM (2003), sites are located within sand sheets adjacent Chinamans Hollow Creek. Although, the excavations of these areas only revealed a very low density of artefacts (<123), and suggest occupation of the immediate region was minimal historically;
- A physical inspection of the Study Area revealed it to be a heavily vegetated, but lacking any viable water source which would attract long term camping or sand sheets, and hence unlikely to retain Aboriginal objects/sites;
- One isolated find, *Spine Road 1*, in a disturbed context, was found during the physical inspection; and
- At this stage, the Study Area is considered to retain low archaeological sensitivity, with the exception of the immediate vicinity of *Spine Road 1*. Refer to section 6.2.

7.0 Significance Assessment

7.1 Principles of Assessment

Heritage sites, objects and places hold value for communities in many different ways. The nature of those heritage values is an important consideration when deciding how to manage a heritage site, object or place and balance competing land-use options. The many heritage values are summed up in an assessment of "Cultural Significance".

The primary guide to management of heritage places is the Australia ICOMOS Charter for Places of Cultural Significance (The Burra Charter) 1999. The Burra Charter defines cultural significance as follows:

> *Cultural significance* means aesthetic, historic, scientific, social or spiritual value for past, present or future generations.
>
> Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.
>
> Places may have a range of values for different individuals or groups.

This assessment has sought to identify heritage objects and sites within the study area and obtain enough information to allow the values of those objects and sites to be determined.

7.2 Social Value to the Aboriginal Community

Aboriginal sites with archaeological evidence are all of value to the Aboriginal community because they represent a tangible connection with pre-European Aboriginal life.. HLA ENSR has provided this report to the Aboriginal communities involved in the project and will be seeking their values, prior to its finalisation.

All comments from the Aboriginal community are included in the text of the report where appropriate, and attached in **Appendix B**.

7.3 Scientific Value

Scientific value is assessed according to the research potential of a site. Rarity and representativeness are also related concepts taken into account. Research potential or demonstrated research importance is considered according to the contribution that a heritage site can make to present understanding of human society and the human past. Heritage sites, objects or places of high scientific significance are those which provide an uncommon opportunity to inform us about the specific age of people in an area, or provide a rare glimpse of artistic endeavour or provide a rare chronological record of changing life through deep archaeological stratigraphy.

The comparative rarity of a site is a consideration in assessing scientific significance. A certain site type may be "one of a kind" in one region, but very common in another. Artefacts of a particular type may be common in one region, but outside the known distribution in another.

The integrity of a site is also a consideration in determining scientific significance. While disturbance of a topsoil deposit with artefacts does not entirely diminish research value, it may limit the types of questions that may be addressed. A heavily cultivated paddock may be unsuited to addressing research questions of small-scale site structure, but it may still be suitable for answering more general questions of implement distribution in a region and raw material logistics.

The capacity of a site to address research questions is predicated on a definition of what the key research issues are for a region. In the region the key research issues revolve around the chronology of Aboriginal occupation and variability in stone artefact manufacturing technology. Sites with certain backed implements from the Holocene are very common, but sites with definite Pleistocene evidence are extremely rare, and hence of extremely high significance if found.

7.3.1 Assessment

In relation to the Study Area is considered of low archaeological significance. This assessment has been made while considering the location of known archaeological material in the region, (namely adjacent large creek lines and any adjoining tributaries and upon/within Aeolian sand sheets, in contrast to the Study Area, which retains undefined drainage lines and duplex soils), several previous studies undertaken in the immediate vicinity (ERM 2003, 2004; Harpers Somers O'Sullivan 2007), and the physical inspection.

In relation to *Spine Road 1*, the site is also considered of low archaeological significance. The assessment of this site is based on the disturbed surface nature of the object, and hence the limited research potential (both in relation to subsurface archaeology or technological information) it retains. Furthermore, as outlined in **Section 5.3.2**, all 31 of the sites found within 10 km^2 of the Study Area are artefactual in nature, and therefore the site cannot be considered rare..

This assessment presently is on scientific values. The value of a cultural heritage and Aboriginal sites to the Aboriginal community is acknowledged here, with all comments from the Aboriginal communities presented in **Appendix B**.

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8.0 Impact Assessment

This section provides consideration of the potential impacts to archaeological material of the proposed activities within the Study Area. The purpose of this report is to identify the location and significance (heritage values) of sites so that planning can proceed in a manner that minimises impact. Furthermore, this section provides guidance as to the definition and management of "impacts".

An "impact" is defined here as an action or activity that results in the disturbance, damage or destruction of an Aboriginal object or Aboriginal site. Not all actions or activities disturb, damage or destroy Aboriginal sites and therefore not all actions or activities may be considered as "impacts".

For the purposes of this discussion an activity on, under or in the vicinity of an Aboriginal object or Aboriginal site may be classified as having no impact, low impact, moderate impact or high impact. These classes are described in **Table 3** below.

Table 3: Impact Ranking in Relation to Aboriginal Objects and/or Sites.

Impact Rank	Definition	Management Action
No Impact	No change in heritage value e.g. no displacement of Aboriginal objects.	No action required.
Low Impact	Negligible displacement of individual objects, no disruption of archaeological deposit or spatial distribution of artefact assemblage and no negative affect on heritage value e.g. change in elevation via subsidence without vertical displacement.	No action required.
Moderate Impact	Partial loss of heritage value or potential for activating erosive effect which will degrade heritage values over time, e.g. activation of changed erosion regime through hydrological changes resulting in accelerated erosion of archaeological deposit. The Aboriginal site will remain after cessation of the impacting activity, but in a degraded state e.g. with an eroded and dispersed stone artefact assemblage instead of intact archaeological deposit.	Appropriate level of mitigation measures required to ensure the Aboriginal objects/sites are appropriately investigated and/or documented before impact, and potential monitoring to occur after impacts to ensure no further impact is occurring through environmental modification.
High Impact	Removal or displacement of an Aboriginal object or Aboriginal site resulting in the loss of Aboriginal heritage values	Detailed and comprehensive mitigation measures required to ensure the Aboriginal objects/sites are appropriately investigated and/or documented before impact, and potential monitoring to occur after impacts to ensure no further impact is occurring through environmental modification.

Based on discussions with Valad, impacts will include the industrial development of Precinct 1which will follow rezoning of the area, and the installation of two roads – Pelaw Main Bypass and Station Road extension. Specific impacts are undefined at this stage, but are likely to include the extensive clearance of vegetation, the excavation, levelling and filling of various development areas, and other ancillary activities assosciated with industrial infrastructure (such as services, roads, transmission lines, etc).

One isolated find, *Spine Road 1,* has been identified within the Study Area, since it is an Aboriginal object. The site has low archaeological significance and it seems likely that the artefact will be located within the centre of development within Precinct 1, and as such impacts to this site may occur.

It should be further noted that given the site's location upon a steep slope within 2 m of a drainage line, natural factors (such as erosion, sheet wash or flooding) are also likely to impact or displace this site (in effect destroying a site).

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9.0 Conclusions and Recommendations

This investigation based on previous archaeological research, both local and regional, and a physical investigation, identified one Aboriginal site within the Study Area. The likelihood of further Aboriginal sites being present within the Study Area is low based on a number of factors, including the location of existing archaeological sites, previous studies and past impacts to the area.

Based on the background research, Aboriginal site location within the HEZ is focussed upon the larger defined creek lines (such as Wallis Creek, Swamp Creek and Chinaman's Hollow Creek) and within aeolian sand sheets. The latter forming the archaeological conservation zone in the north of the HEZ. An investigation of the AHIMS database identified 31 sites within 10 x 10km area, all of which were artefactual in nature.

The physical inspection of the Study Area was severely inhibited by dense vegetation cover and leaf litter, but did reveal extensive areas of undulating slopes and hills dominated by duplex soils. No evidence of defined creek lines were identified, only a number of open depressions and ill formed drainage lines. No aeolian sand sheets were identified as part of the investigation.

One Aboriginal site, *Spine Road 1*, was identified within the northwest corner of Precinct 1. The site was located on the edge of a minor drainage line in a disturbed context. The site, an early reduction silcrete core, was not considered scientifically significant. No further areas of the Study Area were considered of archaeological interest – although it should be noted that there are four sites (HEZ 2, HEZ 6, UTCA 1, and UTCA 2) within the immediate vicinity of Precinct 1, and these are being managed based on other studies, and are not considered here.

The specific potential impacts to *Spine Road 1* at this stage are unknown, but it seems likely that through natural or human modifications to the drainage line, the site will be impacted and/or destroyed. Hence, recommendations outlined below include the appropriate salvage of this site prior to any form of development. With the exception of *Spine Road 1*, this report did not identify any further heritage constraints within Precinct 1, Pelaw Main Bypass and Station Road extension Study Areas.

9.1 General Recommendations

- In the event that previously undiscovered Aboriginal objects (or potential Aboriginal objects) are discovered during construction, all works in the vicinity of the find would cease and the relevant HEZ Environmental Representative would be informed to determine the subsequent course of action. The HEZ Environmental Representative would, if required, notify a heritage professional to obtain advice on how to proceed. Works would not recommence until any heritage requirements identified through this process have been met; and
- Should suspected skeletal material be uncovered during the course of any site works or through subsidence landscape modification, all works must cease and the DECC the NSW Police and the NSW Coroners office contacted immediately, regardless of any existing environmental approvals.
- All contractors who work within the confines of the Study Area should be made aware of these recommendations, and advised of the importance and protection of Aboriginal Objects/Sites by State legislation. All contractors should be advised of the need to stop work and contact the relevant HEZ Environmental Representative should Aboriginal Objects/Sites be identified during construction.

9.2 Specific Recommendations

- *Spine Road 1,* located within the northwest section of Precinct 1, should be collected by a heritage professional in consultation with the registered Aboriginal communities prior to any development activities. Identification of the "keeping place" of this site, should be identified in conjunction with the Aboriginal communities prior to the site's collection; and,
- With the exception of *Spine Road* 1 there are no apparent constraints to development in Precinct 1, Pelaw Main Bypass and Station Road extension in relation to Aboriginal heritage.

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Figures

Figure 1: Map of Study Area.

Figure 2: Map of Transects undertaken as part of this Report.

Figure 3: Map of Aboriginal sites based on an AHIMS search of the local area.

Figure 4: Map of Aboriginal Sites identified as part of this Study.

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Plates