

5.10 Survey Unit 10

5.10.1 Location and Description

Survey Unit 10 commences at the intersection of Dog Hole Road and Seahampton Road (Figure 63). The route follows the former alignment of the Richmond Vale Railway (Figure 64) and a section of Seahampton Road, which mostly follows the former railway route. Much of this section of Seahampton Road consists of unsealed road with deposited gravel road base. The road is level throughout the survey unit, with the route alignment following the south-eastern bank of the Blue Gum Creek valley in rolling, hilly terrain (Figure 65). The route has been laid level with numerous railway cuttings through these hills (Figure 66).

Survey Unit 10 then meets an intersection at the Quarry Access Road and includes several lay-down areas which are located in cleared areas around the Seahampton Road / Quarry Access Road intersection. The survey unit then proceeds further to the south, through heavily vegetated hills, with a number of significant railway cuttings incised through the local landscape.

Survey Unit 10 terminates at the Cessnock LGA / Lake Macquarie LGA boundary. The survey unit is approximately 2.5km in length. The location of Survey Unit 10 is illustrated in Figure 69.

5.10.2 Environmental Context

Survey Unit 10 is located in the eastern foothills of Black Hill, with the gradient of the undulating terrain increasing as the survey unit proceeds south-west. The survey unit is largely located on the upper margin of the Blue Gum Creek valley and is approximately 5m to 10m higher than the adjacent creek line. Construction of the Richmond Vale Railway involved incised cuttings through the sandstone geology and hills in this area, with significantly steep open cuttings visible on either side of the route.

Soil landscapes in the vicinity are a mix of residual and colluvial soils, of the Beresfield, Rivermead, Cedar Hill, Killingworth and Stockrington soil landscapes. The Beresfield soil landscape consists of light brown sandy loam soils, while the remaining colluvial soil landscapes are brown to dark brown clayey loams with significant ironstone and gravel inclusions. These soils are highly erodible.

Water bodies in the area include the nearby Blue Gum Creek and its unnamed ephemeral tributaries.

5.10.3 Ground Visibility and Disturbance

Ground visibility for much of the survey unit is relatively high, due to the majority of the survey unit being located on an unsealed access track. This access track, particularly in the southern part of the survey unit, has areas which have been heavily eroded causing some areas of significant sub-surface exposure.

A large area in the northern portion of the survey unit has thick grass and weed which reduces the ground visibility to nil (Figure 68). This area, near the Dog Trap Road intersection, is also situated on the former alignment of the Richmond Vale Railway. However, in this area, much of the route follows Seahampton Road. Seahampton Road is partially bituminised in the northern portion of Survey Unit 10. The road has been extensively modified with episodes of road grading as well as the distribution of road base and gravels to stabilise the road. Much of this road is also located within Richmond Vale Railway cuttings, indicating that the natural bedrock below any introduced roadway fill would be considered archaeologically sterile.

Much of the southern and central portion of the route is located on top of the former rail alignment, and the ground has been extensively disturbed in these areas with the construction of the rail line and the introduction of fly ash and railway ballast. Large portions of this part of the route are located inside former railway cuttings (Figure 118), and the natural bedrock located below any introduced fill would be considered archaeologically sterile.

Figure 63: Intersection of Dog Hole Road and Seahampton Road, north-east aspect



Figure 64: Remains of Richmond Vale Railway line, Seahampton Road at right of image. South-western aspect.



Figure 65: Rolling hills to the north-west of the survey unit, with creek terrace and Blue Gum Creek visible in the background. North aspect.



Figure 66: Railway cuttings through the survey unit, south-western aspect



Figure 67: Dense grass and weed in northern portion of the survey unit, west aspect



Figure 68: Sandstone railway cutting, south aspect



5.10.4 Summary of Aboriginal Sites

One previously recorded Aboriginal site is located in Survey Unit 10. However, this site was not able to be re-located during the site inspection. This site is summarised in Table 9 and discussed in Section 6.1.2.

Table 9: Previously recorded Aboriginal sites in Survey Unit 10

Site Name	Easting	Northing	Extent
Blue Gum Creek RTA 4 IF (AHIMS ID 38-4-1348)	██████	██████	0.5m x 0.5m

Six previously unrecorded Aboriginal sites were identified during the site inspection in survey unit 10. Four of these sites were located in close proximity to each other in deposited road base and have been treated as similar sites (RVRT IF 4, RVRT AS 4, RVRT AS 5, RVRT IF 6). Five of these newly identified sites are located within the study area and are summarised in Table 10. One site was identified approximately 20m from the study area and is summarised in Table 11 (RVRT IF 5). The locations of these sites are illustrated in Figure 69.

The four sites located within the Seahampton Road deposited road base are described in Section 6.3, while RVRT AS 6 is discussed in Section 6.4.6.

Table 10: Aboriginal sites in Survey Unit 10

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Isolated Find 4 (RVRT IF 4) (AHIMS ID 38-4-1884/ 38-4-1913)	██████	██████	0.5m x 0.5m
Richmond Vale Rail Trail Artefact Scatter 4 (RVRT AS 4) (AHIMS ID 38-4-1877/ 38-4-1915)	██████	██████	82m x 9m
Richmond Vale Rail Trail Artefact Scatter 5 (RVRT AS 5) (AHIMS ID 38-4-1878/ 38-4-1912)	██████	██████	3m x 3m
Richmond Vale Rail Trail Isolated Find 6 (RVRT IF 6) (AHIMS ID 38-4-1886/ 38-4-1911)	██████	██████	0.5m x 0.5m
Richmond Vale Rail Trail Artefact Scatter 6 (RVRT AS 6) (AHIMS ID 38-4-1879/ 38-4-1916)	██████	██████	4m x 2m

Table 11: Aboriginal site located near Survey Unit 10

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Isolated Find 5 (RVRT IF 5) (AHIMS ID 38-4-1885/ 38-4-1924)	██████	██████	0.5m x 0.5m

Figure 69: Location of Survey Unit 10 showing Aboriginal sites



5.11 Survey Unit 11

5.11.1 Location and Description

Survey Unit 11 commences at the boundary between Cessnock and Lake Macquarie LGAs and follows the alignment of the former Richmond Vale Railway along an unnamed access track to the south-west. The survey unit proceeds along the former rail line alignment through Tunnel No. 1 beneath the Hunter Expressway, before curving to the west and north, before ceasing at the northern end of Tunnel No. 2 (Figure 70).

The majority of the survey unit is located inside deep sandstone cuttings created during the construction of the former railway line (Figure 71). The northern and central portions of Survey Unit 11 consisted of high artificial embankments over nearby steep ravines. Some portions of the survey unit are located on the outer and upper margins of the railway cuttings and embankments, including areas of low disturbance adjacent to the alignment of the former railway line. The topography near the rail line consists of rolling and moderately steep hills and creek gullies covered in regrowth eucalypts and understory (Figure 72).

Survey Unit 11 is 2.6km in length and its location is illustrated in Figure 76.

5.11.2 Environmental Context

The survey unit is located in the northern foothills of Sugarloaf Mountain, and roughly parallel to the course of Blue Gum Creek. Two prominent ridge crests which descend off Mt Sugarloaf form the northern and southern watersheds of Blue Gum Creek. The northern end of the survey unit consists of the former railway tunnel which extends through this ridge line.

The survey unit traverses the Killingworth soil landscape, which consists of thin humic topsoil overlying dark grey-brown sandy clays. This soil landscape is highly erodible. Below the clays of the Killingworth soil landscape, the geology consists of the interlaying conglomerate, sandstone and shale strata of the Newcastle Coal Measures (Figure 73).

Water bodies in the area include Blue Gum Creek directly to the north of the survey unit. Burnt Creek and a number of unnamed ephemeral tributaries flow into Blue Gum Creek. The artificial Burrenjim Dam is located to the north of the survey unit. These water courses are up to 20m below the elevation of the former railway line and are at the base of steep gullies.

5.11.3 Ground Visibility and Disturbance

The majority of the survey unit has high ground visibility, as the Richmond Vale Railway has been used as a four-wheel drive and motorbike access road since the railway was closed. Those areas of Survey Unit 11 located off the former rail line are covered with a light understory with a heavy covering of leaf litter and minimal surface visibility (Figure 74).

In the north of Survey Unit 11, artificial mounds and rollovers have been created to control stormwater runoff in the area. Vehicle tracks and tyres have caused significant rutting throughout the survey unit while in other locations significant quantities of water and sediment have washed down the sides of the embankment cuttings onto the access track (Figure 75).

Due to the steep topography throughout the survey unit, and the cutting and embankment-building caused by the construction of the original railway line, Survey Unit 11 is predominantly located on artificially-modified ground. Areas in the north of the survey unit are located on natural ground surfaces, although the majority of the route between Tunnel No. 1 and Tunnel No. 2 is situated on

either lowered cuttings through archaeologically sterile stratigraphic units, or on artificially constructed embankments.

Areas of least ground disturbance within the study area are located in the wider margins of the route corridor, on the upper edges of the embankment cuttings above the route. While there has been minor ground disturbance caused by the construction of stormwater channels and fence post installation, the majority of these areas exhibit intact ground surfaces.

Figure 70: Southern portal to Tunnel No. 2, north aspect



Figure 71: Railway sandstone cuttings in survey unit, west aspect



Figure 72: Regrowth understory and eucalypts above and around rail cutting in survey unit 11, north east aspect



Figure 73: Shale, sandstone and conglomerate strata of Newcastle Coal Measures visible in rail cutting, east aspect



Figure 74: Vegetation on either side of the survey unit, north east aspect



Figure 75: Vehicle rutting through Survey Unit 11, south-west aspect



5.11.4 Summary of Aboriginal Sites

There is one previously listed AHIMS site located adjacent to Survey Unit 11, however this site was not able to be relocated during the site inspection. This site is shown in Table 12 and further discussed in Section 6.1.3.

Table 12: Previously recorded Aboriginal site adjacent to Survey Unit 11

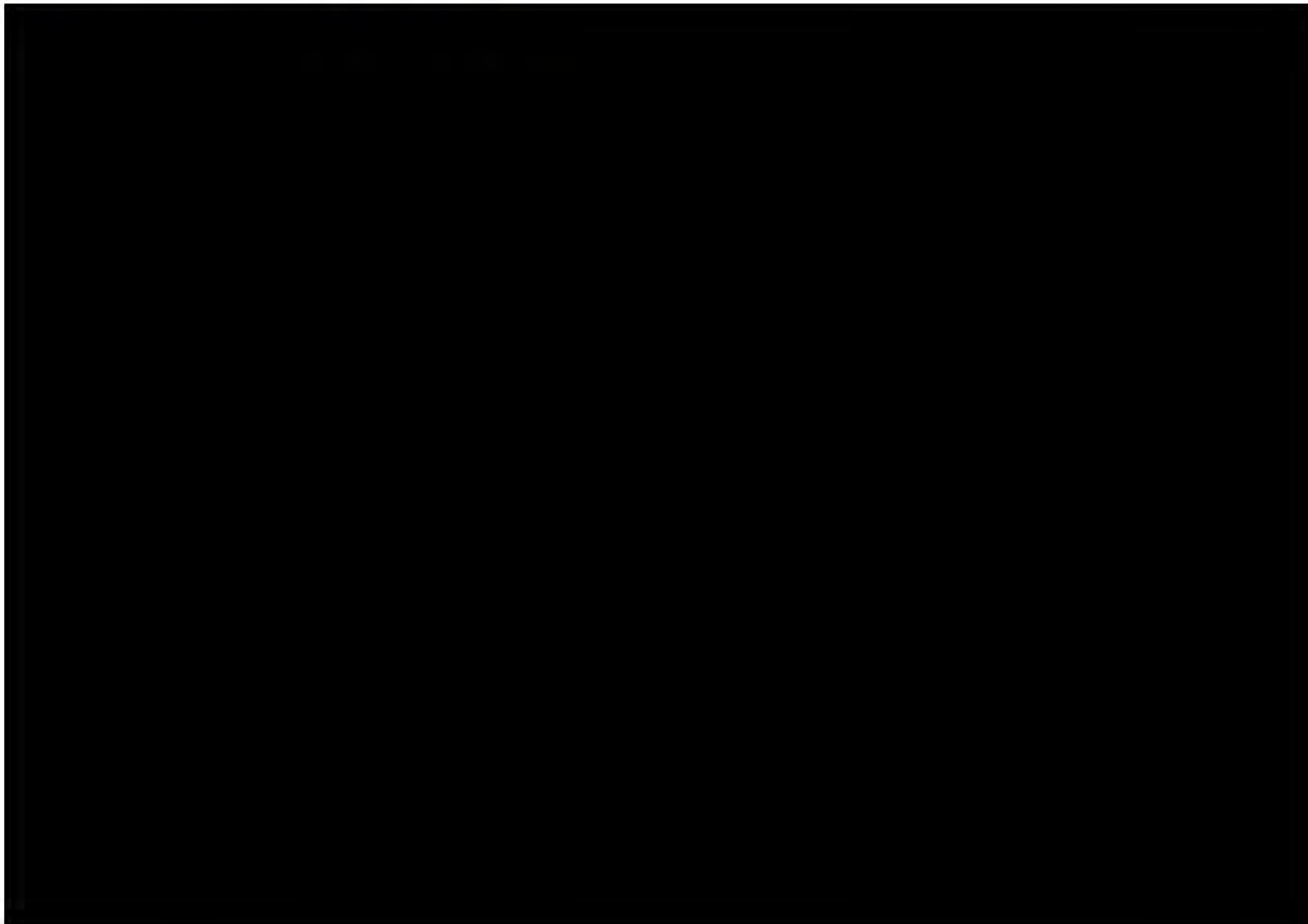
Site Name	Easting	Northing	Extent
Blue Gum Creek 2 Artefact Scatter (AHIMS ID 38-4-0761)	██████	██████	Not provided

One previously unrecorded Aboriginal site was identified during the site inspection. This site is shown in Table 13 and further discussed in Section 6.4.7.

Table 13: Newly identified Aboriginal site adjacent to Survey Unit 11

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Isolated Find 7 (RVRT IF7) (AHIMS ID 38-4-1887/ 38-4-1921)	██████	██████	0.5m x 0.5m

Figure 76: Location of Survey Unit 11 with Aboriginal sites



5.12 Survey Unit 12

5.12.1 Location and Description

Survey Unit 12 commences at the northern portal of Tunnel No. 2, and curves to the north then west around the northern protruding spur lines that descend from Mount Sugarloaf. This region of the route consists of steep cuttings and embankments (Figure 77) and tall constructed embankments over deep creek gullies (Figure 78). The survey unit then traverses to the west through slightly more level country, before crossing Surveyors Creek on large constructed former rail embankments. The survey unit then terminates at the eastern portal of Richmond Vale Railway Tunnel No. 3 in a deep sandstone cutting.

Survey Unit 12 predominately adheres to the former width of the Richmond Vale Railway line, with some portions of the study area slightly wider than the former railway alignment to include the larger supporting embankment base and the upper edges of the sandstone cuttings. Two lay down and construction areas are also included in the survey unit, located to the north of the former rail alignment in cleared and levelled areas.

The survey unit is approximately 5km long and its location and features are illustrated in Figure 83.

5.12.2 Environmental Context

The eastern portion of the survey unit is located through and over the far northern margin of three north-south aligned spur crests that descend from Mount Sugarloaf. Located between these spur crests are three unnamed upper tributaries of Surveyors Creek. The soil landscapes in these areas alternates between Killingworth and Beresfield residual soil landscapes, both of which are highly erodible. These soil landscapes overlie the conglomerates, shales and sandstone of the Newcastle Coal Measures.

As the northern Mount Sugarloaf spur crests level out towards the north, the slope gradient decreases as the survey unit extends north and west. In the west of the survey unit, the ground levels out to open rolling plains towards Richmond Vale, with lower gradient hill slopes and wider expanses between ridge lines.

Water courses in the survey unit consist of Surveyors Creek and its tributaries. The ground near Surveyors Creek and the former rail bridge in that location consists of eroded and disturbed sand beds (Figure 79).

5.12.3 Ground Visibility and Disturbance

The majority of the survey unit consists of either deep sandstone cuttings or high elevation embankments over the surrounding terrain. These areas have a high degree of visibility where vehicle traffic has removed vegetation. The ground surface in these areas shows significant amounts of rail ballast and ash (Figure 80), or has been extensively eroded to expose the underlying conglomerate soil and geological material (Figure 81 and Figure 82). These areas of the survey unit are considered entirely disturbed.

The laydown areas to the north of the main rail alignment are located on level ground which has been previously cleared for vehicle use and for lay down areas. Ground visibility in these areas is high, however frequent vehicle traffic in these locations has heavily disturbed the ground surface, with evidence of introduced road base and deposited gravels as well as the removal of the former ground surface.

Figure 77: Shallow sandstone cutting through survey unit, south-west aspect



Figure 78: Edge of raised embankment through the survey unit, north aspect



Figure 79: Eroded and disturbed sandy creek bank at Surveyors Creek, north aspect



Figure 80: Ash and rail ballast on raised embankment, west aspect



Figure 81: Underlying geology of route exhibited in eroded portion of the trail, west aspect



Figure 82: Strata of rail ballast overlying soil and conglomerate layers, north aspect



5.12.4 Summary of Aboriginal Sites

No Aboriginal sites were identified within Survey Unit 12.

Figure 83: Location of Survey Unit 12



5.13 Survey Unit 13

5.13.1 Location and Description

Survey Unit 13 commences at the eastern portal of Tunnel No. 3 and traverses the low sloping terrain of the Wallis Creek valley (Figure 84). The majority of the survey unit is located in cleared open pasture with areas of vegetation predominately located at the far western and eastern ends of the area. The survey unit is located within former railway cuttings in the east of the survey unit (Figure 85), before resting on a small artificial embankment until it reaches Wallis Creek.

The survey unit adheres to the alignment of the railway line, with an additional area to the north which consists of a driveway for a property that links to George Booth Drive. Additional areas on the banks of Wallis Creek to the north and south of the rail alignment on both sides of the creek were also included in the survey unit.

The survey unit is approximately 1.8km long. The location of the survey unit is illustrated in Figure 90.

5.13.2 Environmental Context

The survey unit traverses across the largely north-south orientated, low relief, Wallis Creek valley. This valley is fringed by two low relief ridgelines, also orientated to the north and south. The survey unit traverses across and through the eastern ridgeline (Figure 86), before cutting through a low relief knoll in the centre of the valley and then reaching the alluvial plain at Wallis Creek. The soil landscapes in this area consist of Beresfield residual soils in the east with alluvial deposited Wallis Creek soils in the centre and west of the survey unit. On the western side of Wallis Creek, the route diverts to the south to cross over a gentle spur crest before rising in elevation again.

Water courses in the survey unit consist of Wallis Creek and its unnamed upper tributaries. The banks of Wallis Creek are partially terraced, with an extensive flood zone on either side (Figure 87).

5.13.3 Ground Visibility and Disturbance

Grass covers the majority of the former railway line in this survey unit, which is predominantly located through private property and the surface has not been significantly de-vegetated through vehicle traffic. While the Richmond Vale Railway traverses slightly less steep terrain, the majority of the route is raised on embankments or in artificial cuts. Hill slopes have been partially excised to form cuttings on the taller side, with redeposited material used to build up the embankment on the lower elevated side. The railway line is not located on a natural ground surface, and the majority of the survey unit on the former line would be considered non-natural disturbed ground.

In the east of Survey Unit 13, the study area includes a wide (up to 70m) area surrounding the former rail line and cuttings, including the natural ground surface above Tunnel No. 3 and on either side of George Booth Drive. This area is partially regrowth eucalypt forest, with light understory. These ground surfaces adjacent to George Booth Drive are considered largely intact (Figure 88).

In the centre of the survey unit, a large area was included to accommodate room for the construction of a potential replacement bridge over Wallis Creek. The ground in this area is located on cleared pastoral terrain that leads onto creek terraces adjacent to Wallis Creek. While vegetation clearing and pastoral land use would have caused some ground disturbance, the ground surface in this area is also considered largely intact.

The unsealed driveway to access the property at 1353 George Booth Drive consists of a graded and levelled access track which cuts approximately 20cm deep into the natural ground surface (Figure

89). Archaeological visibility in this area is considered high, and this driveway is considered moderately ground disturbed.

Figure 84: Low relief hill slopes in the Wallis Creek valley, north aspect



Figure 85: Western portal of Tunnel No. 3 with high steep cuttings, north-east aspect



Figure 86: View of low relief hills on western side of Wallis Creek valley, east aspect



Figure 87: Banks of Wallis Creek, with regrowth Casuarina along flood zone, north-west aspect



Figure 88: Regrowth vegetation on natural ground above Tunnel No. 3, east aspect



Figure 89: Graded and levelled driveway at 1353 George Booth Drive, west aspect



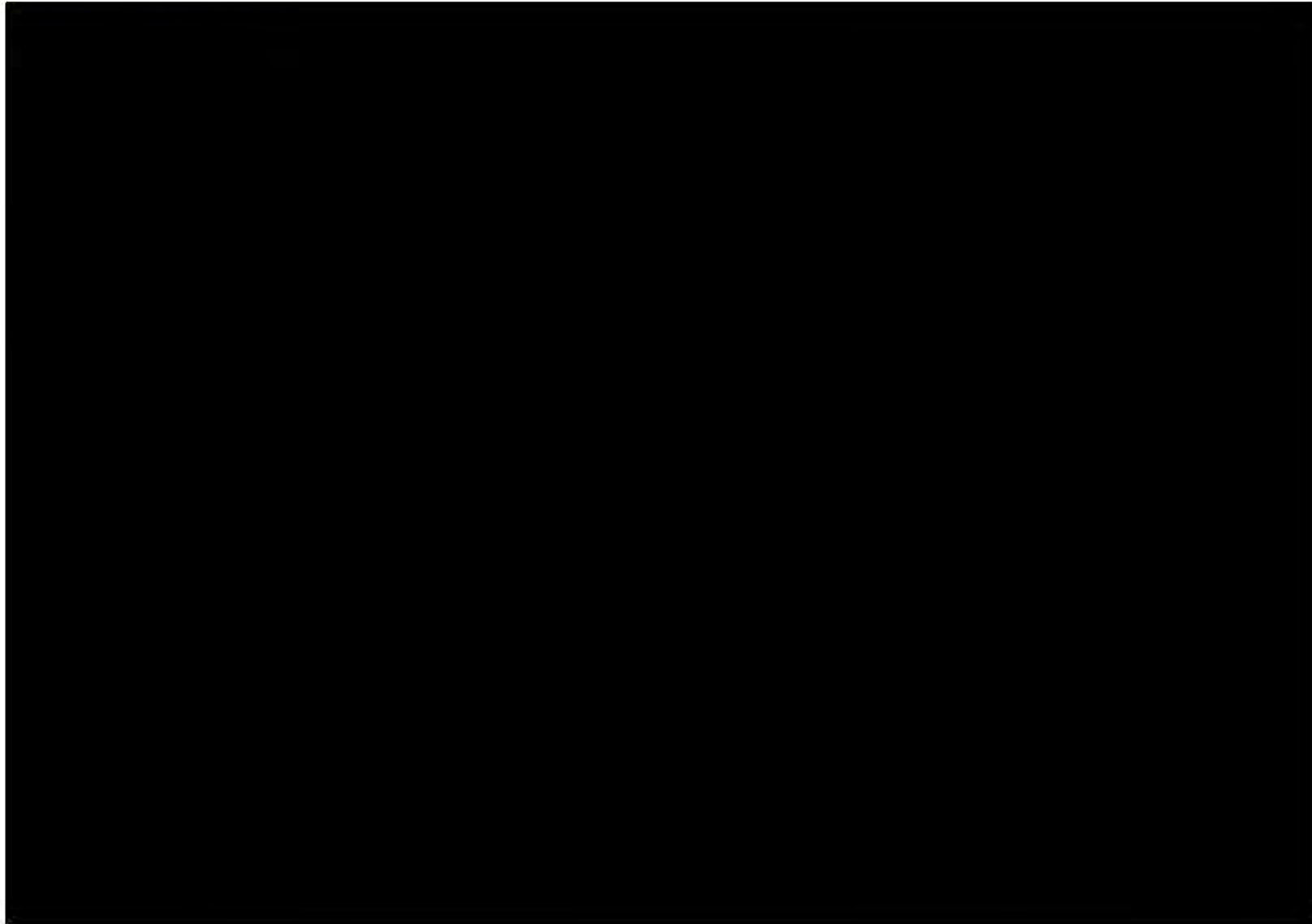
5.13.4 Summary of Aboriginal Sites

One PAD was identified during the site inspection. This PAD is shown in Table 14 and further discussed in Section 6.

Table 14: Newly identified Aboriginal sites in Survey Unit 13

Site Name	Easting	Northing	Extent
Richmond Vale Rail Potential Archaeological Deposit 1 (RVRT PAD 1) (AHIMS ID 38-4-1926)	██████	██████	50m x 25m

Figure 90: Location of Survey Unit 13



5.14 Survey Unit 14

5.14.1 Location and Description

Survey Unit 14 commences on the Richmond Vale Railway just before the boundary of the Werakata State Conservation Area (SCA) at the intersection of the railway line with a transmission line easement (Figure 91). The survey unit turns north-west through the conservation area until it terminates just to the south of an open vehicle access area and fire trail intersection in the centre of the park. The survey unit in this area is largely level, with the former railway line either cut through or raised above the surrounding SCA (Figure 92).

The route through this area is predominantly constrained to the width of the former Richmond Vale Railway alignment towards Pelaw Main, with minor ancillary areas located on either side of the route near the entrance to the SCA. An additional area of the survey unit is an ancillary access track which connects to the railway from Leggett's Drive in the west.

The survey unit is approximately 1.8km long and its location is illustrated in Figure 97.

5.14.2 Environmental Context

The survey unit traverses through the relatively level terrain of the Werakata SCA, with a gentle hill slope at the east of the survey unit where it exits the outer portion of the Wallis Creek valley. The Werakata SCA contains regrowth sclerophyll (Figure 93) and marshland eucalypt species fringing wetland sumps and ephemeral streams that feed into Wallis Creek.

The soil in this survey unit consist of Heddon Greta and Neath sand profiles, predominantly consisting of an upper stratum of light brown sandy loam and sandy clay. These sands overlies Maitland Group conglomerates and sandstones. Natural silcrete was identified in exposed sand, showing evidence of machine damage (Figure 94).

5.14.3 Ground Visibility and Disturbance

The former railway line was constructed either level with the surrounding forest or on small embankments through the area. However, large areas of the former railway line have been machine cleared and graded, exposing the underlying sandy loam and leaving furrows of former rail ballast and ash on the margins of the rail line (Figure 95). Visibility and exposure for much of the survey unit is very high.

Ground disturbance across the survey unit is also quite high, due to the machine levelling and removal of the former railway line. The use of the route as a vehicle access track and fire trail has also caused ground disturbance in the form of wheel ruts and subsequent erosional impacts. Road base and gravels have been deposited on some parts of the route to stabilise the vehicle access road (Figure 96).

Figure 91: Entrance to the Werakata SCA showing moderate railway line embankment, north-west aspect



Figure 92: Graded and cleared access route in survey unit, north west aspect



Figure 93: Regrowth eucalypt forest near the survey unit, north aspect



Figure 94: Natural silcrete, heavily machine damaged



Figure 95: Graded access track with former rail ballast and ashy soil furrowed on edge of road, east aspect



Figure 96: Wheel rutting and erosional damage on route, north west aspect



5.14.4 Summary of Aboriginal Sites

One previously unrecorded Aboriginal site was identified during the site inspection in Survey Unit 14. This site is shown in Table 15 and further discussed in Section 6.

Table 15: Newly identified Aboriginal sites in Survey Unit 14

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Isolated Find 8 (RVRT IF 8) (AHIMS ID 37-6-3806/ 37-6-3834)	██████	██████	0.5m x 0.5m

Figure 97: Location of Survey Unit 14



5.15 Survey Unit 15

5.15.1 Location and Description

Survey Unit 15 commences in the middle of the Werakata SCA, south east of Pelaw Main. The unit follows the former Richmond Vale Railway north-west until it crosses Pokolbin Street in to Pelaw Main. It then parallels Pokolbin Street on an open grass verge until it reaches Mulbring Street, where the line terminates.

The survey unit in the east traverses through the revegetated SCA and is located through several cuttings and embankments throughout this portion of the route as the relief gradient increases towards Pelaw Main. The survey unit includes both the sandstone cuttings of the former railway line, and the existing adjacent vehicle access track through the SCA. Once the line has crossed over Pokolbin Street, the route is located on the edge of suburban streets and in cleared and mowed parkland and road verges (Figure 98).

There are three ancillary areas included in the survey unit which are adjacent to the former railway route. At the south-east of the survey unit, a lay down area has been designated in an existing clearing to the south-west of the rail route. A further ancillary area is located in a cleared area south of the route just to the east of where the former rail line meets Pokolbin Street (Figure 99). A final ancillary area has been designated at the end of the line, in a grassed parkland between Mulbring Street and Stanford Street.

The survey unit is approximately 2.4km long and its location illustrated in Figure 104.

5.15.2 Environmental Context

The south-eastern portion of the survey unit is located in the Werakata SCA, which is a revegetated eucalypt forest and partial wetland. The area here is relatively level and poorly drained, with estuarine freshwater swamps and sluggish ephemeral creeks (Figure 100). The slope gradient increases towards Pelaw Main, with embankment and excavated cuttings in this part of the route (Figure 101). The soils in this area are characterised by Neath soil landscapes, a brown to light brown sandy loam, overlying conglomerate and sandstone Maitland Group geological resources.

The north-western portion of the survey unit is located within the residential environment of Pelaw Main. The former alignment of the railway is visible on the side of Pokolbin Street as a raised embankment with black ashy soils (Figure 102). Water courses in this portion of the survey unit consist of stormwater drainage and open unnamed creeks which feed into the lower Wallis Creek tributaries.

5.15.3 Ground Visibility and Disturbance

Ground visibility in the portion of the survey unit which travels through the Werakata SCA is high, due to the machine grading and levelling of the former railway line. This machine grading has removed the former ballast and rail and exposed much of the underlying sand substrate of the region. As the topography increases to the north-west, the former railway line runs through shallow cuttings which are incised below the natural ground level. The survey unit parallels these cuttings across the existing vehicle access track however, which is located on the natural ground level. Machine grading and erosional damage on the route, adjacent access tracks and nearby cleared lay down areas has caused moderate ground disturbance, however much of the lower sand body remains intact.

Visibility across the portion of the survey unit in Pelaw Main on the other hand is nil to low, due to extensive grass cover and bitumen roads. The survey unit follows the former rail line route in Pelaw

Main and is located on a raised embankment which is imported fill and consequently classified as disturbed ground. Laydown areas in the Log of Knowledge Park at the terminus of the line have not experienced ground disturbance however and would be considered to be largely intact (Figure 103).

Figure 98: Residential areas near survey unit, Pelaw Main. South aspect.



Figure 99: Cleared lay down area in Werakata SCA, west aspect



Figure 100: Marshy wetland adjacent to survey unit in Werakata SCA, west aspect



Figure 101: Former rail cutting in Werakata SCA, south-east aspect



Figure 102: Raised embankment and ashy soil of former rail line, Pelaw Main. North west aspect.



Figure 103: Level, relatively undisturbed ground at the Log of Knowledge Park, Pelaw Main. North aspect.



5.15.4 Summary of Aboriginal Sites

One newly identified Aboriginal site was identified during the site inspection in Survey Unit 15, while another Aboriginal site was identified less than 10m from the outer boundary of the survey unit. These sites are shown in Table 16 and Table 17, and further discussed in Sections 6.

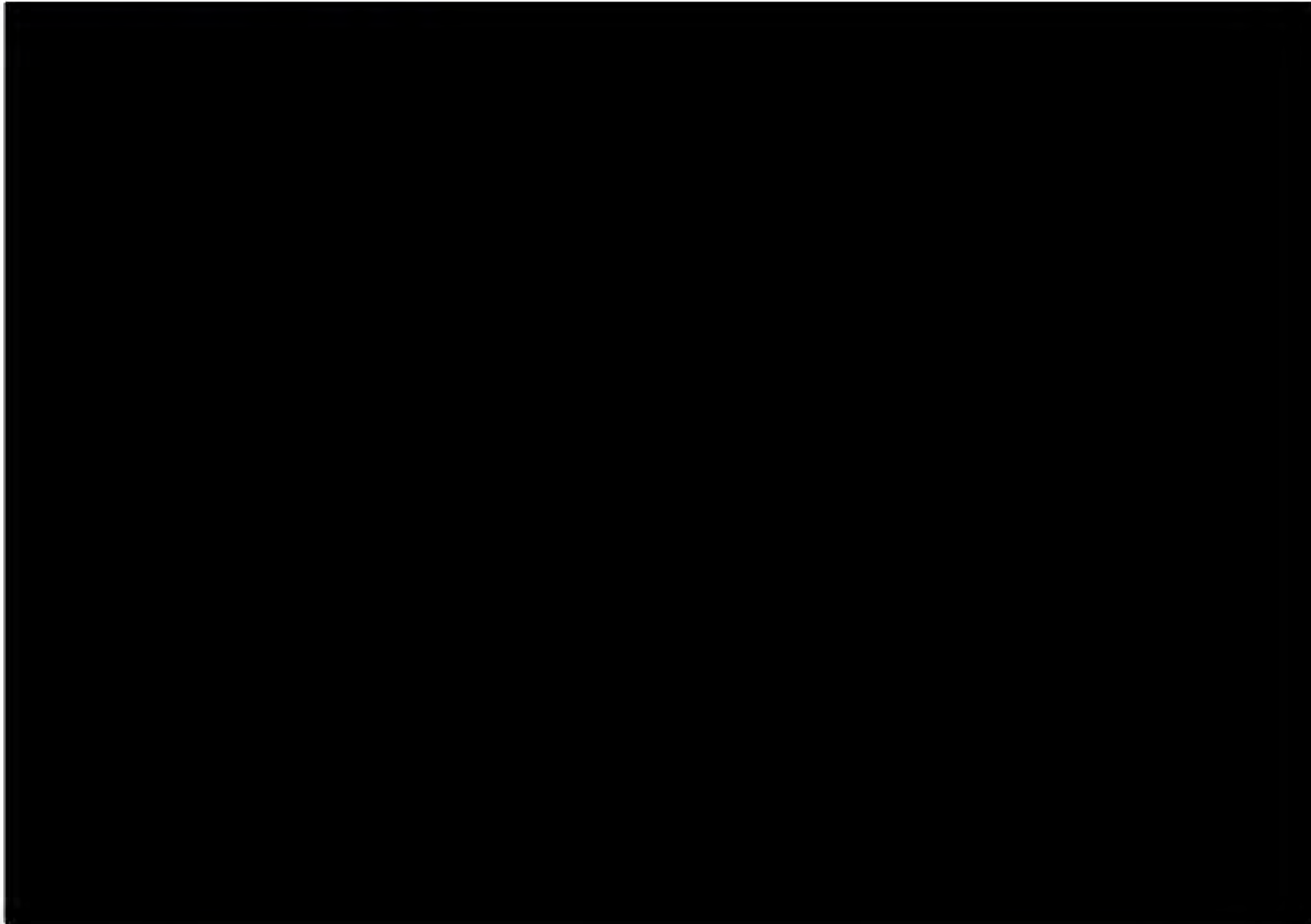
Table 16: Newly identified Aboriginal sites in Survey Unit 15

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Isolated Find 10 (RVRT IF 10) (AHIMS ID 37-6-3808/ 37-6-3832)	██████	██████	0.5m x 0.5m

Table 17: Newly identified Aboriginal sites near Survey Unit 15

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Isolated Find 9 (RVRT IF 9) (AHIMS ID 37-6-3833/ 37-6-3807)	██████	██████	0.5m x 0.5m

Figure 104: Location and features of Survey Unit 15



5.16 Survey Unit 16

5.16.1 Location and Description

Survey Unit 16 commences at the Hunter Wetlands Centre carpark, immediately to the south of the Wetland Centre facility building (Figure 105). The survey unit proceeds as a linear area, following an existing Hunter Wetlands Centre pedestrian walkway (Figure 106), for approximately 1.5 kilometres until it terminates in open ground to the south of Ironbark Creek (in the northern portion of Survey Unit 1).

In addition to the pedestrian pathway, the survey unit also includes several small adjacent areas for construction and stockpiling facilities along the side of the pedestrian pathway. There is also an additional area in the survey unit, located along the northern side of Blanch Street in Shortland, which extends for approximately 180 metres.

The location of the survey unit is illustrated in Figure 111.

5.16.2 Environmental Context

The majority of Survey Unit 16 is located within the Hunter Wetlands Centre, which is a restored wetland habitat area (Figure 107). This area is characterised by a mix of Hexham Swamp Quaternary soils (estuarine and lacustrine silty deposits) and areas of infill and disturbed terrain. The survey unit is located along the lower edge of a small spur crest that is located on the edge of Hexham Swamp. The survey unit only traverses directly up onto the slope of this spur crest in its northern portion near Blanch Street (Figure 108).

Intact Beresfield soil landscapes are present directly to the west of Survey Unit 16 where the Shortland spur crest is located on the outer margins of Hexham Swamp. The survey unit transects these spur crests in places, however those sections of the survey unit have been cut-down or infilled from previous infrastructure activities (Figure 109).

5.16.3 Ground Visibility and Disturbance

The Hunter Wetland Centre is a restored estuarine landscape which has been restored as a native species habitat within the last thirty years. Prior to this, much of the area was in use as a landfill deposit as well as an area with artificially constructed sports playing fields. The majority of the survey unit is located along reclaimed and infilled ground along the edge of Hexham Swamp. The pedestrian pathway through much of the survey unit has been top-dressed with sand and gravel, with areas of former asphalt evident along the route (Figure 110).

A part of the northern portion of the survey unit is located on the northern hill crest on Blanche Street, Shortland. This area is characterised by a grass verge and partly revegetated lower slope. At the base of the slope there is washed in sediment from the surrounding properties and previous episodes of vegetation clearance. As such, the majority of the survey unit has been characterised as ground disturbed. Due to the survey unit's location on an open unsealed access track, the surface visibility for much of the survey unit is moderate to high.

Figure 105: Hunter Wetland Centre main facility, with graded pedestrian pathway in foreground, south-east aspect



Figure 106: Pedestrian pathway through Survey Unit 16 in Hunter Wetlands Centre, north-west aspect



Figure 107: Bridge over channels of Hexham Swamp at the Hunter Wetlands Centre, north-west aspect



Figure 108: Blanche Street road verge and revegetated area on edge of lower Shortland hill crest, west aspect



Figure 109: Artificial cutting of pedestrian pathway into Hexham Swamp-adjacent spur crest, south-west aspect



Figure 110: Asphalt capping on pedestrian pathway, west aspect



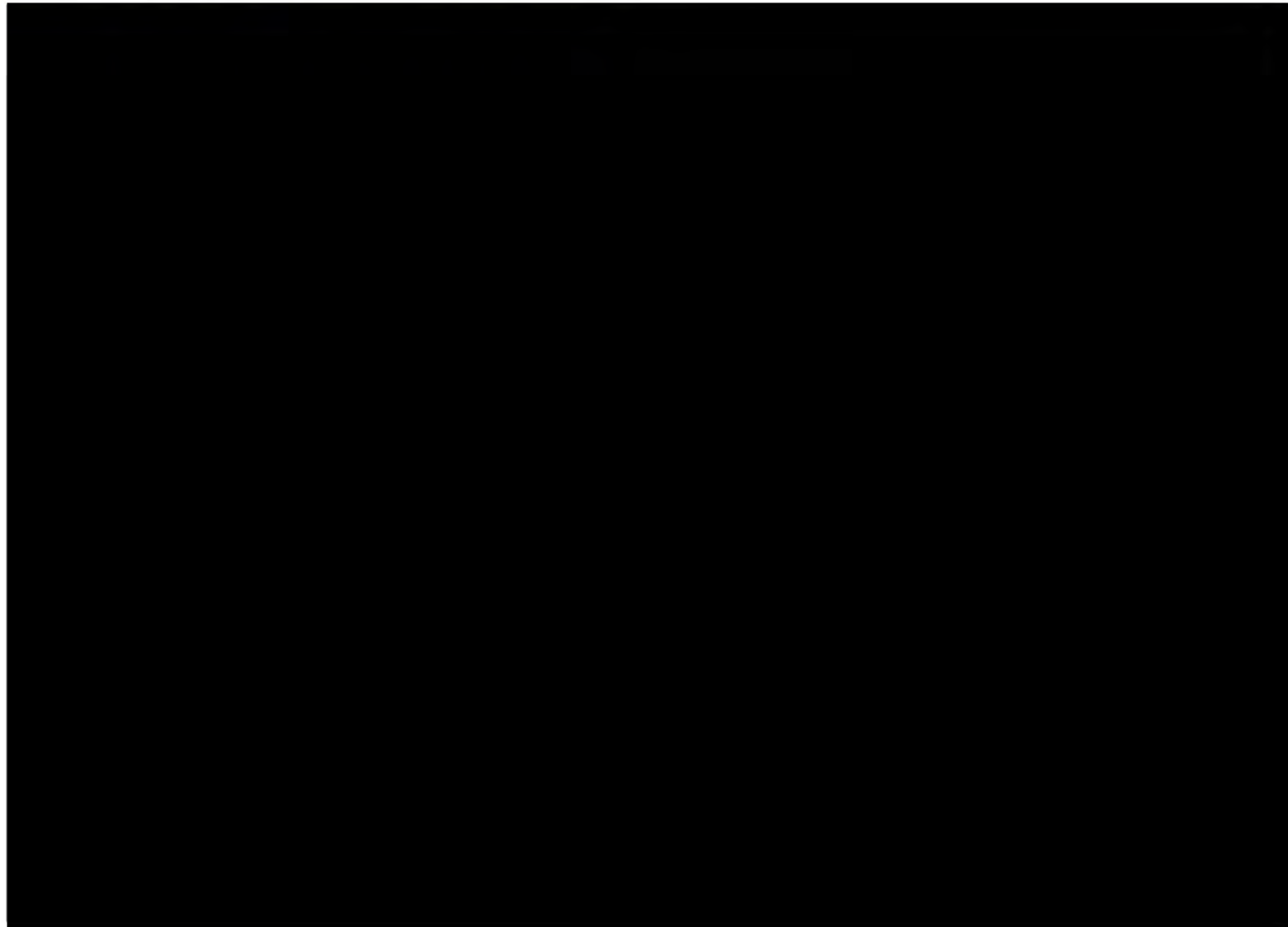
5.16.4 Summary of Aboriginal Sites

One newly identified Aboriginal site was identified during the site inspection in Survey Unit 16. This site is summarised in Table 18 and further discussed in Section 6.

Table 18: Newly identified Aboriginal sites in Survey Unit 16

Site Name	Easting	Northing	Extent
Richmond Vale Rail Trail Isolated Find 11 (RVRT IF 11) (AHIMS ID 38-4-1925)	██████	██████	0.5m x 0.5m

Figure 111: Location of Survey Unit 16 with location of Aboriginal site



5.17 Effective Survey Coverage

A summary of survey coverage, in accordance with the OEH code of practice, is outlined in Table 19 and Table 20.

Table 19: Survey coverage summary – Survey Units

Survey Unit	Landforms	Survey Unit Area (sq m)	Visibility (%)	Exposure (%)	Effective Coverage Area (sq m)	Effective Coverage (%)
1	Flat, Slope, Crest	24,846	30	25	1864.077	7.50
2	Flat	9,949	20	5	99.49	1.00
3	Flat	64,744	70	30	13596.24	21.00
4	Flat	53,341	70	30	11201.61	21.00
5	Flat, Slope, Crest	48,873	30	10	1466.447	3.00
6	Flat	153,746	30	10	4612.38	3.00
7	Flat, Slope, Crest	15,319	5	5	38.2975	0.25
8	Flat, Slope	40,814	10	5	204.4272	0.50
9	Flat, Slope	60,410	20	10	1208.2	2.00
10	Flat, Slope	48,199	70	20	6748.246	14.00
11	Flat, Slope	121,823	30	15	5478.381	4.50
12	Flat, Slope, Crest	23,4915	30	20	14094.9	6.00
13	Flat, Slope	78,779	20	10	1575.58	2.00
14	Flat, Slope	31,599	80	40	10111.68	32.00
15	Flat, Slope	55,149	50	20	5516.775	10.00
16	Flat, Slope	4,996	80	35	1390.43	28.00

Table 20: Survey coverage summary – landforms

Landform	Landform Area (sq. m)	Area Effectively Surveyed (sq. m)	% of landform effectively surveyed	Number of sites	Number of artefacts or features
Flat	543,810	53,614	9.86	6	6
Slope	458,862	25,172	5.49	7	30
Crest	39,284	3,168	8.06	6	39

6.0 ARCHAEOLOGICAL SITES

6.1 Previously Recorded Aboriginal Sites

A number of previously recorded AHIMS sites are located both within, and in the vicinity of, the study area. Due to the large number of registered AHIMS sites in the vicinity of the study area, only those sites which were located within the study area were prioritised for inspection. Nearby AHIMS listed sites were opportunistically inspected where possible.

The following section describes those sites either listed within the study area, or which were identified near the study area during the survey.

6.1.1 HS 2 (AHIMS # 38-4-1583)

Within the study area

Survey Unit: 5

Site Location: [REDACTED]

Site Description: As discussed in Section 3.1.4, the site was identified as part of the Hexham Relief Roads Project by AMBS in 2011. The site consisted of a chert flake and a fine-grained siliceous flake, recovered from test excavation pits in a disturbed context. The site was designated as having low archaeological sensitivity due to the small number of artefacts recovered and the high degree of disturbance.

Site Status: The site is located [REDACTED] [REDACTED] Permits associated with the site (#3761, #3888) indicate that this site has been impacted by test excavation, prior to construction of the Aurizon facility access road.

The site was not relocated during the site inspection, and is likely to have been wholly, or partially, destroyed. Further confirmation, including obtaining copies of relevant approvals for impact, will be required to determine the status of this site.

6.1.2 Blue Gum Creek RTA IF 4 (AHIMS# 38-4-1348)

Immediately outside the study area

Survey Unit: 10

Site Location: [REDACTED]

Site Description: The site was originally identified [REDACTED] [REDACTED] The site was recorded as comprising a single silcrete broken flake on a high visibility access track. Due to the high degree of surface impacts and erosional damage on the access track, the original recording categorised the site as having low archaeological integrity and potential. The original recording identified the artefact in a deep, washed out exposure, with continued water and vehicle exposure likely to result in further movement of the artefact.

Site Status: Vehicle access tracks in the vicinity of Seahampton Road are highly eroded, heavily impacted ground surfaces. No Aboriginal objects were identified at AHIMS# 38-4-1348 during the current site survey. This is likely due to the heavily eroded condition of the track surface.

6.1.3 Blue Gum Creek 2 Artefact Scatter (AHIMS# 38-4-0761)

Immediately outside the study area

Survey Unit: 11

Site Location: [REDACTED]

Site Description: This site was originally identified [REDACTED] [REDACTED] A total of 24 artefacts were identified on the highly eroded access tracks which converge on the Richmond Vale Railway, approximately 25m to the west of the western portal to Tunnel No. 1. The site was in poor condition when originally identified due to extensive erosion and vehicle damage on the track.

Site Status: The Richmond Vale Railway line has been used as a 4WD access track, and the intersection to the west of Tunnel No. 2 where the artefact scatter was located sees heavy and damaging traffic. The original site was in poor condition during its first identification, and displayed little archaeological integrity or potential. Further erosion, sediment deposition and vehicle damage have further impacted the site.

The listed location of the AHIMS listed site was inspected during the site inspection, and no artefacts could be relocated. The fact that the artefacts could not be relocated is likely due to the very high level of ground disturbance, both from high levels of deposited sediment (Figure 112), and in other places the high level of eroded out skeletal soils (Figure 113) at the recorded site location.

Figure 112: View of access track intersection, east aspect



Figure 113: Context photo of eroded vehicle track near location of Blue Gum Creek 2 Artefact Scatter, north aspect



6.1.4 Blue Gum Creek Grinding Grooves (AHIMS# 38-4-0235)

Outside the study area

Survey Unit: 80m north of Survey Unit 11

Site Location: [REDACTED]

Site Description: This site is located outside the study area. The site consists of three grinding grooves on sandstone located [REDACTED]

Site Status: The grinding grooves were observed to be in good condition.

Figure 114: Detail of sandstone grinding grooves



Figure 115: Context photo of Grinding Groove site, west aspect



6.1.5 Blue Gum Creek Grinding Grooves (AHIMS# 38-4-0236)

Outside the study area

Survey Unit: 50m north of Survey Unit 11

Site Location: [REDACTED]

Site Description: This site is located outside the study area. The site consists of six grinding grooves [REDACTED]

Site Status: The grinding grooves were relocated and remain in good condition.

Figure 116: Detail of sandstone grinding grooves



Figure 117: Context photo of Grinding Groove site, north aspect



6.2 Richmond Vale Rail Trail Archaeological Complex 1 (RVRT AC1)

Site Complex Location: [REDACTED]

Site Complex Description: A series of sites (illustrated in Figure 122) were identified [REDACTED] [REDACTED] Due to the proximity of these sites to each other (four sites along a linear corridor of 500m) and their co-location in the same landform context, they have been categorised as a site complex. Sites and artefacts were identified in this area due to erosional soil exposures caused by pedestrian traffic, water runoff, car and bus parking, and periodic vegetation clearance.

While there is significant ground disturbance in the local area, this ground disturbance is largely limited to linear corridors parallel to King Street. On the far eastern side, directly adjacent to King Street, a number of service utility trenches are located in that area (Figure 118). On the far western side of this linear area, a raised embankment is located which was where a former Hunter Water pipeline had been installed (Figure 119). In the margin between these two areas, however, the landform does not appear to have been subject to extensive or deep ground-disturbance (Figure 120). Surface disturbance has removed the grass cover in some places, and allowed for increased erosion, however the wider landform in this medial area is largely intact (Figure 121).

Figure 118: Exposed stormwater service adjacent to King Street, north-east aspect



Figure 119: View of embankment of former Hunter Water pipeline and wooden fence, west aspect



Figure 120: Area of ground surface exposure adjacent to King Street, south-east aspect

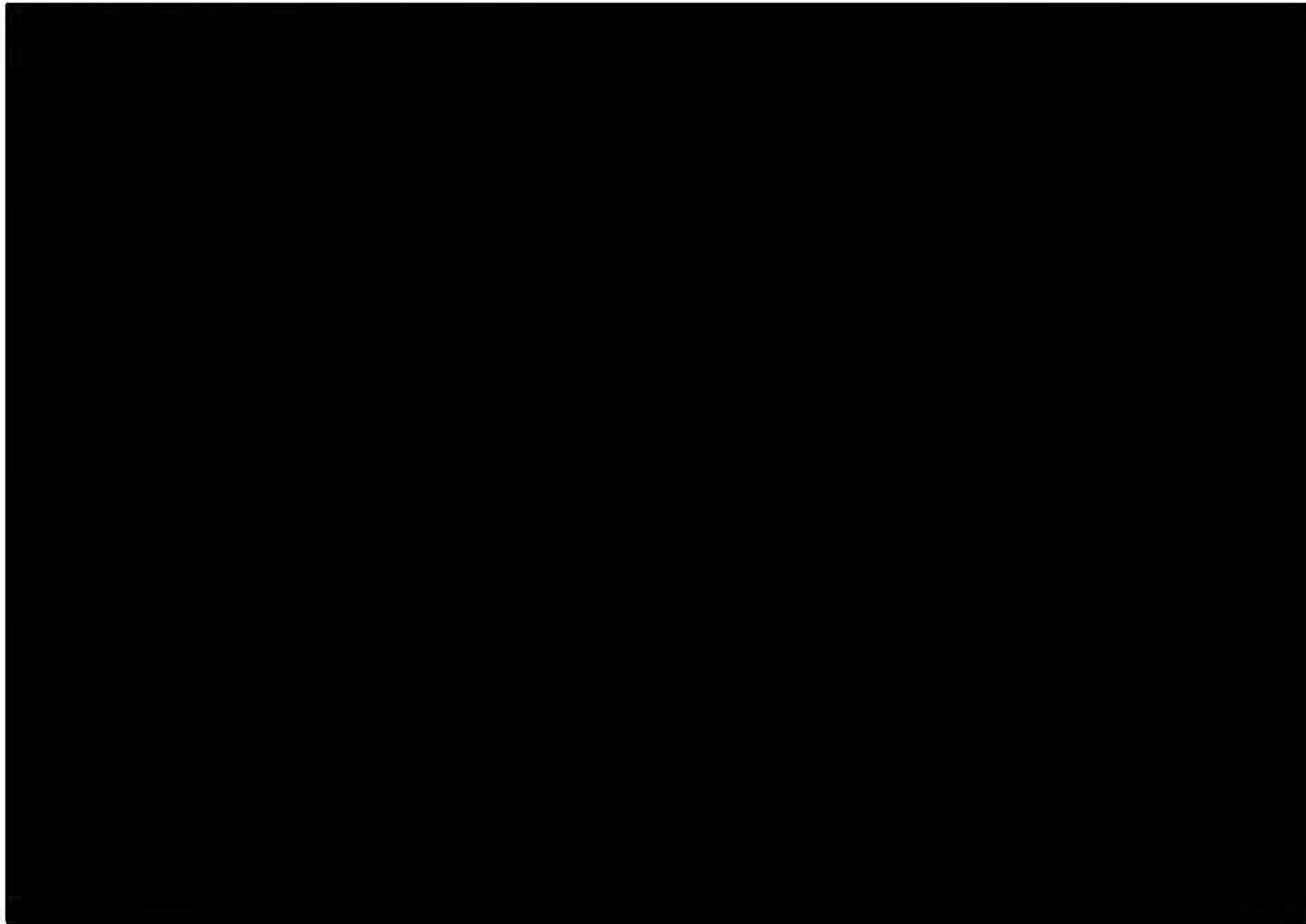


Figure 121: Intact landform between King Street and embankment of former pipeline



Sections 6.2.1 to 6.2.4 discuss sites identified as part of the RVRT AC 1 in detail.

Figure 122: Map of the RVRT Archaeological Complex 1



6.2.1 Richmond Vale Rail Trail Artefact Scatter 1 (RVRT AS1)

AHIMS ID: AHIMS ID 38-4-1874/ 38-4-1919)

Site Location: [REDACTED]

Site Extent: 36m by 7m (extent to be clarified by archaeological test excavation)

Site Description: the site was identified [REDACTED] (Figure 123). The ground was exposed from surface disturbance caused by vehicle driving and parking on the road verge (Figure 124). The site is located [REDACTED].

Six Aboriginal artefacts were identified, including a red-white indurated mudstone / tuff (IMT) core (Figure 125). The remainder of the artefacts recovered were red-white IMT and grey and red silcrete stone tools (flake fragments) (Figure 126).

Figure 123: View of RVRT AS 1 landscape, utility service corridor on left, south-east aspect



Figure 124: View of RVRT AS 1 landscape, north aspect



Figure 125: IMT core with negative flake scars from RVRT AS 1



Figure 126: Recovered artefacts from RVRT AS 1



6.2.2 Richmond Vale Rail Trail Isolated Find 1 (RVRT IF1)

AHIMS ID: AHIMS ID 38-4-1881/ 38-4-1920

Site Location: [REDACTED]

Site Description: the site was identified in an exposure near the base of a tree, [REDACTED] (Figure 127). The site was located in ground which did not appear to have been heavily disturbed. The site consisted of a single quartzite flake (Figure 128).

Figure 127: Exposure around base of tree where site was identified, north-east aspect



Figure 128: Quartzite artefact, RVRT IF 1



6.2.3 Richmond Vale Rail Trail Artefact Scatter 2 (RVRT AS2)

AHIMS ID: AHIMS ID 38-4-1875/ 38-4-1918

Site Location: [REDACTED]

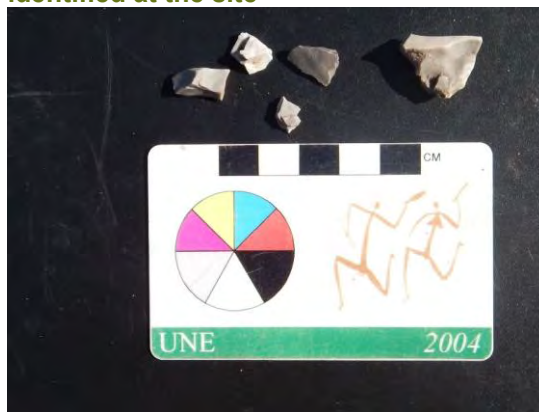
Site Extent: 9m by 5m (extent to be clarified by archaeological test excavation)

Site Description: the site was identified in surface exposures around the base of several trees, [REDACTED] (Figure 127). A total of 13 artefacts were identified, consisting of red banded silcrete and grey IMT (Figure 128). Recovered artefacts were flake fragments less than 30mm in size.

Figure 129: Exposure where RVRT AS 2 was identified



Figure 130: Silcrete and IMT artefacts identified at the site



6.2.4 Richmond Vale Rail Trail Artefact Scatter 3 (RVRT AS3)

AHIMS ID: AHIMS ID 38-4-1876/ 38-4-1917

Site Location: [REDACTED]

Site Extent: 4m by 3m (extent to be clarified by archaeological test excavation)

Site Description: the site consisted of five artefacts identified [REDACTED]

[REDACTED]. The soil exposure showed a high quantity of natural angular gravels (Figure 131). Two artefacts, one of grey IMT and one of red silcrete, were identified in the exposure (Figure 132).

Figure 131: Exposure where RVRT AS 3 was identified.



Figure 132: Silcrete and IMT artefacts identified at the site



6.3 Seahampton Road Archaeological Sites (RVRT IF 4, RVRT AS 4, RVRT AS 5 and RVRT IF 6)

Location of Seahampton Road Sites: [REDACTED]

Description of Seahampton Road Sites: A series of sites (illustrated in Figure 147) were identified [REDACTED]

[REDACTED] Due to the proximity of these sites to each other in succession (separated by a maximum distance of 250m) and their identification in the same landscape context, these sites are discussed in relation to each other.

These sites were identified in gravels and sand which has been deposited as road base along Seahampton Road and the adjacent road shoulder. Gravels which had been deposited consisted of a mix of angular and sub-rounded pebbles in a light brown sandy matrix (Figure 133). The identified Aboriginal objects were mixed indiscriminately with this road base. The road is predominantly unsealed with small remnant bitumen areas from a former sealed surface (Figure 134). Much of the road in this area is located at a lower elevation to the adjacent hills, which have been incised and cut for the creation of the level railway track (Figure 135). As such, the road represents a non-natural ground surface, at sufficient depth for much of it that Aboriginal objects would not be naturally located in this area.

The distribution of artefacts in the road base strongly suggests that these artefacts have been imported with the gravel and sand for the laying down of the road base. Furthermore, non-worked natural indurated mudstone / tuff cobbles, which have been fractured from machine crushing and vehicle damage, are apparent in the mixed deposit (Figure 136). This further implies that stone material has been indiscriminately collected from a modern quarrying site. As such, Aboriginal objects identified in the Seahampton Road sites are likely to have been imported or moved to their current locations with introduced fill.

While all identified Aboriginal objects in this area were archaeologically recorded, it is possible that due to the small size of the gravel road base, further smaller artefactual materials may be present at, and between, the individual Seahampton Road Sites.

Figure 133: Imported road base and gravels on Seahampton Road and adjacent road shoulder, east aspect



Figure 134: Remnant bitumen from former Seahampton Road sealed road surface, west aspect



Figure 135: Railway cutting of nearby hill to

Figure 136: Machine / vehicle damaged IMT

route, south aspect



cobble in imported road base at RVRT AC 2



6.3.1 Richmond Vale Rail Trail Isolated Find 4 (RVRT IF4)

AHIMS ID: AHIMS ID 38-4-1884/ 38-4-1913

Site Location: [REDACTED]

Site Description: the site consisted of an orange-white IMT whole flake with minor retouch scars (Figure 137). The site was located [REDACTED]

[REDACTED] The road verge consisted of imported gravels and road base which forms the subgrade to Seahampton Road (Figure 138). This artefact is likely to have been imported into the area as part of the road base.

Figure 137: Orange-white IMT flake



Figure 138: Context photo of the RVRT IF 4 site



6.3.2 Richmond Vale Rail Trail Artefact Scatter 4 (RVRT AS 4)

AHIMS ID: 38-4-1877/ 38-4-1915

Site Location: [REDACTED]

Site Extent: 82m by 9m

Site Description: The site is located [REDACTED] [REDACTED] The site consists of 16 artefacts, composed of grey, white and orange-white IMT (Figure 139), and consisted of a core fragment (Figure 140), complete flakes, cortical fragments and partial flakes.

The site extends over a section of road up to 82m long, and spans the length of the exposed road up to 9m wide (Figure 141). The southern side of the road is located directly below the embankment of a former rail cutting (Figure 142), while the northern side of the road is located on a built-up embankment of the former rail line. As such, the ground surface below the deposited road base does not consist of a natural former ground surface and would be considered archaeologically sterile due to the depth of the cutting in this location (up to 3m). Artefacts in this location are considered imported materials which were gathered during sand and gravel dredging for the importation of road base into the area.

Figure 139: Selection of artefacts recovered from RVRT AS 4



Figure 140: Orange-white IMT core fragment at RVRT AS 4

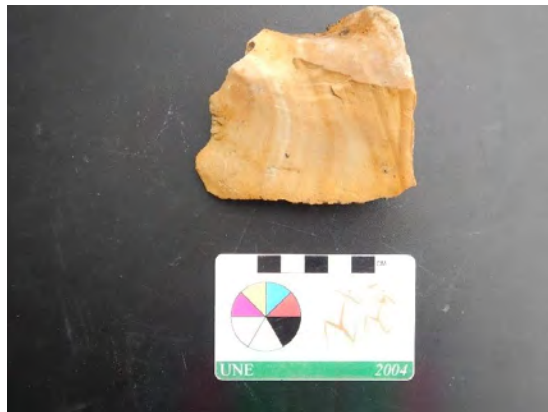


Figure 141: Imported road base and gravel where artefacts were identified in RVRT AS 4, north east aspect



Figure 142: Context photo of RVRT AS 4, with cut embankment in background. South-east aspect.



6.3.3 Richmond Vale Rail Trail Artefact Scatter 5 (RVRT AS 5)

AHIMS ID: AHIMS ID 38-4-1878/ 38-4-1912

Site Location: [REDACTED]

Site Extent: 3m by 3m

Site Description: This site is located [REDACTED]
[REDACTED] The site consists of seven orange-white and grey IMT complete and partial flakes (Figure 143).

Like the other sites of the Seahampton Road Sites, these artefacts were identified in deposited road gravel on an artificial ground surface which had been excised for the construction of the Richmond Vale Railway (Figure 144). Artefacts located at this site are considered to be imported materials which were deposited in the gravel road base to stabilise the Seahampton Road vehicle access track.

Figure 143: IMT artefacts identified at RVRT AS 5



Figure 144: Context image of RVRT AS 5 on vehicle access track, embankment in background, south aspect



6.3.4 Richmond Vale Rail Trail Isolated Find 6 (RVRT IF 6)

AHIMS ID: AHIMS ID 38-4-1886/ 38-4-1911

Site Location: [REDACTED]

Site Description: The site was identified on [REDACTED]

The site consisted of a single coarse grained orange silcrete complete flake (Figure 144). The site was identified in deposited road base above the artificial ground surface of Seahampton Road. Like other sites of the RVRT AC 2, this site was identified as consisting of imported artefactual material within deposited road base gravels (Figure 146).

Figure 145: Coarse grained silcrete artefact identified at RVRT IF 6

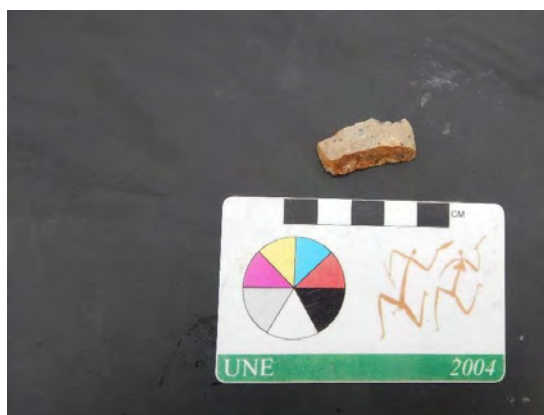
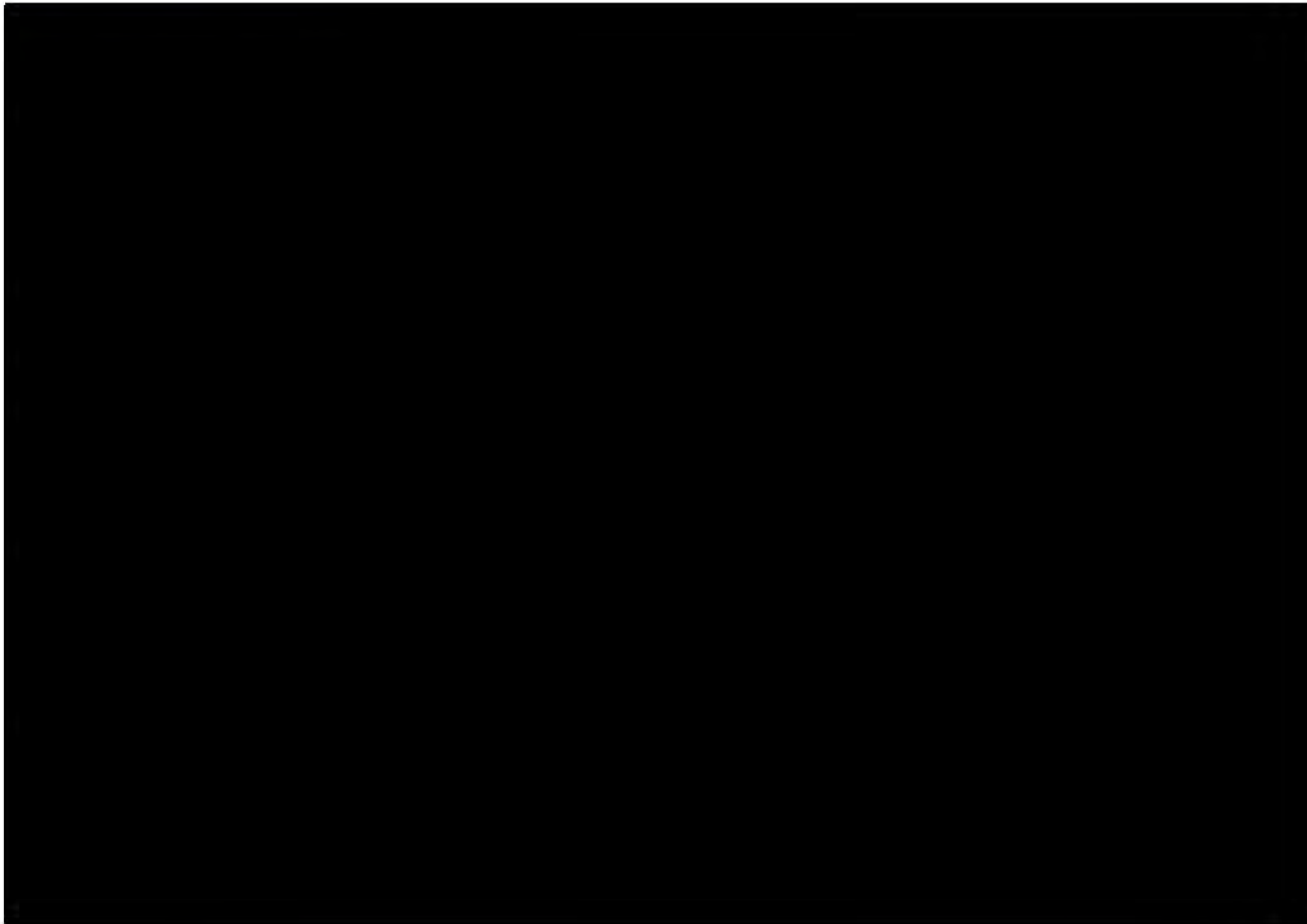


Figure 146: Context image of RVRT IF 6 showing imported gravels and modified landscape in background, south aspect



Figure 147: Map of Seahampton Road Sites



6.4 Individually Identified Aboriginal Sites

6.4.1 Richmond Vale Rail Trail Isolated Find 2 (RVRT IF2)

AHIMS ID: 38-4-1882/ 38-4-1910

Site Location: [REDACTED]

Site Description: the site consisted of a grey and red chert flake fragment identified on a vehicle access track (Figure 148), immediately to the [REDACTED]. Shell material was identified in association with the identified artefact (Figure 149). This access track had been graded with fresh sand and gravels (Figure 150), and was located above a newly installed stormwater culvert (Figure 151). The artefactual material has been introduced to the area.

Figure 148: Grey and red chert flake

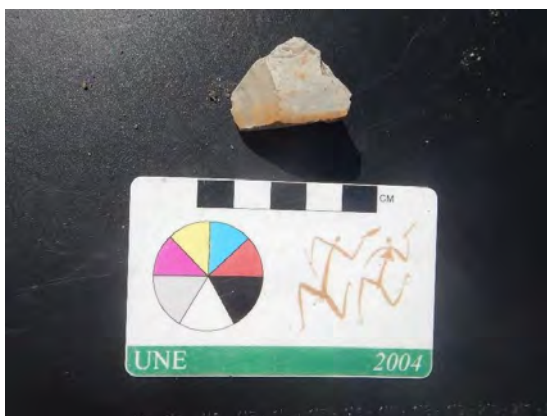


Figure 149: Shell material identified in association with recovered chert flake



Figure 150: Introduced shell-bearing sand over access track



Figure 151: view of access track on right with stormwater pond in foreground



6.4.2 Richmond Vale Rail Trail Isolated Find 3 (RVRT IF3)

AHIMS ID: AHIMS ID 38-4-1883/ 38-4-1922

Site Location: [REDACTED]

Site Description: the site consisted of a single red coarse-grained silcrete complete flake (Figure 152). The site was identified immediately adjacent to the concrete kerb [REDACTED] [REDACTED] (Figure 153). While the artefact was located on this immediate road verge with some evidence of introduced gravels, exposures indicated that the natural Beresfield topsoil was still largely intact.

Figure 152: Red silcrete whole flake

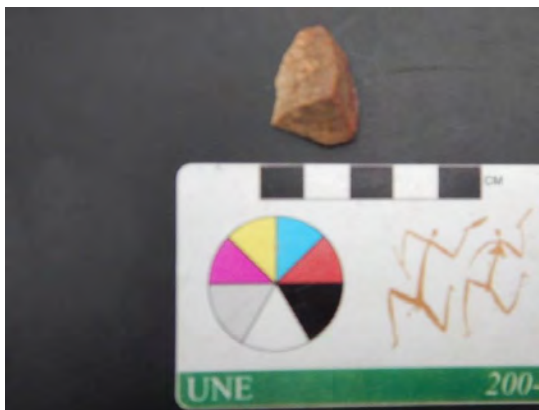


Figure 153: Context photo of RVRT IF 3 site



6.4.3 Richmond Vale Rail Trail Artefact Scatter 7 (RVRT AS 7)

AHIMS ID: AHIMS ID 38-4-1880/ 38-4-1923

Site Location: [REDACTED]

The location and extent of this site is illustrated in Figure 160 (extent to be clarified by archaeological test excavation).

Site Description: the site consists of [REDACTED]

[REDACTED] The site extent is defined as an area between the newly constructed garden beds adjacent to Kural Crescent and the break in slope of the hill crest (Figure 154). The north-western portion of the site extends slightly further down the hill-slope due to the milder gradient in this area. There are significant ground exposures on the northern side of the site due to erosion and slippage on the break in slope of the hill crest (Figure 155).

A total of 13 stone artefacts were identified in the site, in several areas where erosion had caused ground exposures (Figure 156). These artefacts consisted of a mix of grey-white IMT and red silcrete, including core fragments, whole flakes and cortical fragments (Figure 157, Figure 158). Eroded exposures in these areas showed that the ground was natural Beresfield residual soil and did not represent imported material brought in during the construction of the estate.

The wide extent of the area was defined based on predictive statements from archaeological research in the area, which has repeatedly identified the spur crests that project into Hexham Swamp as areas of high archaeological sensitivity. As Hexham Swamp was an abundant source of food and material prior to European settlement, numerous AHIMS sites in the locality are located on spur crests on the fringes of Hexham Swamp, and these swamp-fringing spur crests have been identified from archaeological survey and excavation as areas of high archaeological sensitivity (Apex Archaeology, 2015; Mills Archaeological and Heritage Services, 2003).

The extent of this site was therefore defined by the extent of the relatively level edge to the hill crest, including grassed areas without exposures at the south-western extent of the spur crest within the project study area (Figure 159). There is a small extension in the north-west where the hill-slope gradient is lower than the nearby steeper edge of the spur crest.

The boundaries of this area of site have also been limited by the extent of the project study area. It is likely that the site extends further than the boundaries of the project area. However due to the limitation on the site survey, to inspect only those areas which are designated within the project area, this site has been delimited by the boundary of potential works. Should project works exceed the proposed limits of the study area on the Fletcher spur crest, it is likely that Aboriginal sites would be identified in those locations.

6.4.4 AHIMS Site #38-4-1519 Sanctuary – Estate Stage 4B Fletcher NSW

An AHIMS site (38-4-1519) is located [REDACTED]

[REDACTED] This site is listed as an 'Artefact, Non-Human Bone and Organic Material, Shell' site. The AHIMS database does not provide an extent for this site, and the site card for this site could not be accessed from the OEH. The current status of the site is presently uncertain.

It is possible that the site extent for the AHIMS Site #38-4-1519 extends into boundaries defined for the RVRT AS 7. Further information from the OEH is required to confirm the relative site extent and site status of the AHIMS site.

Figure 154: RVRT AS 7, planted garden beds at right of image, break in slope at left. North-east aspect



Figure 155: Erosional exposure at break in slope of RVRT AS 7, north-east aspect



Figure 156: RVRT AS 7. Red flags indicate location of surface artefacts, south-west aspect



Figure 157: Grey IMT core fragment, grid scale 2mm.



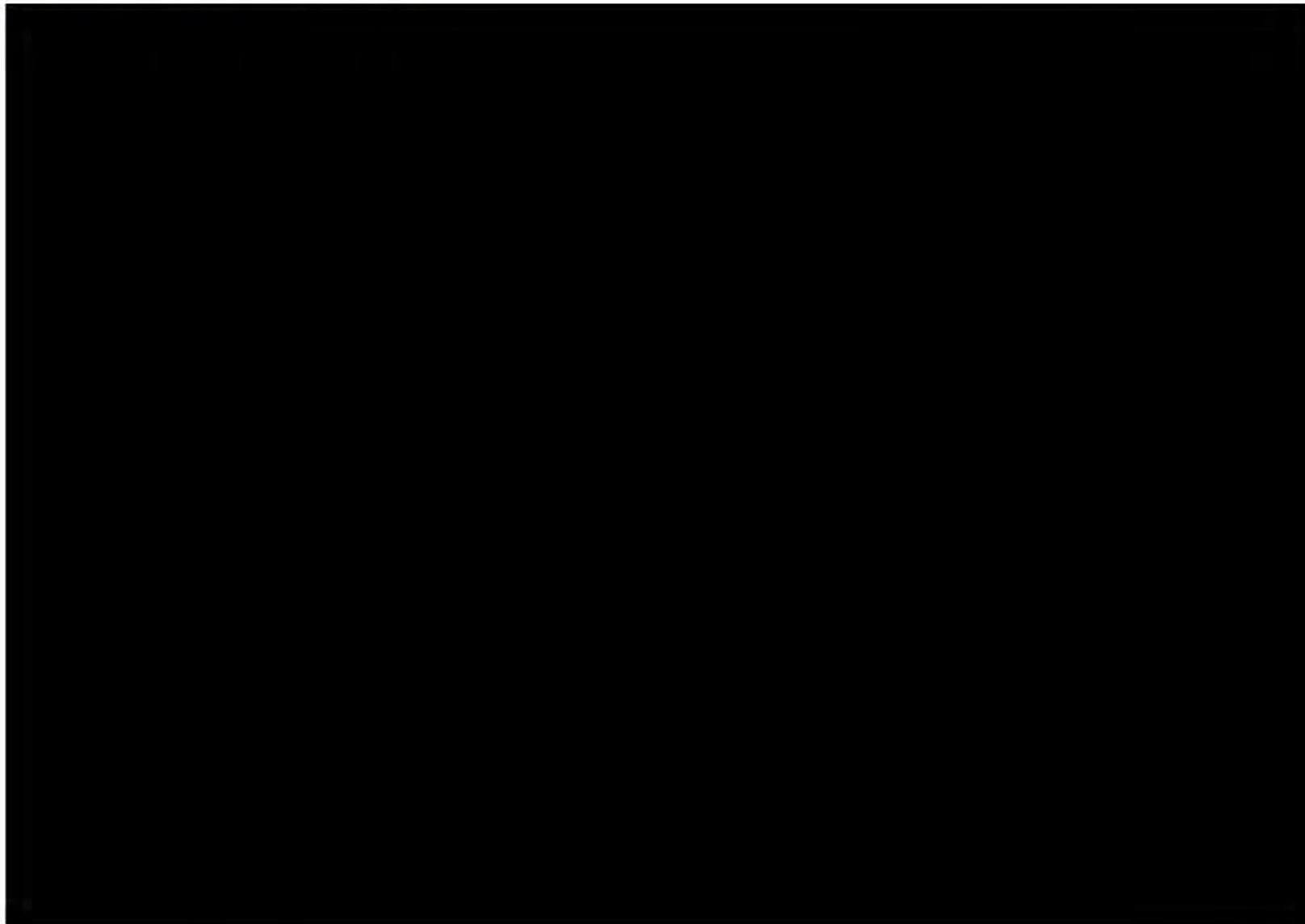
Figure 158: Red silcrete whole flake, grid scale 2mm.



Figure 159: Grassed south-western extent of site, west aspect



Figure 160: Location map and extent of RVRT AS 7



6.4.5 Richmond Vale Rail Trail Isolated Find 5 (RVRT IF 5)

AHIMS ID: AHIMS ID 38-4-1885/ 38-4-1924

Site Location: [REDACTED]

Site Description: The site consists of a single orange IMT artefact which appears to have been damaged and broken by a vehicle or machine (Figure 161). The artefact is located [REDACTED] [REDACTED] While Seahampton Road is predominately incised into the surrounding rolling terrain, the access track that RVRT IF5 is located on consists of a largely natural hillside, with the artefact being recovered from [REDACTED] [REDACTED] (Figure 162). Unlike the nearby artefacts identified with RVRT AC 2 (approximately 30m to the north), the broken artefact identified at RVRT IF 5 was identified in a natural ground context, with only minimal disturbance from wheel rutting.

Figure 161: Machine broken IMT artefact at RVRT IF 5



Figure 162: Context photo of RVRT IF 5, showing moderate hill slope. North-west aspect.



6.4.6 Richmond Vale Rail Trail Artefact Scatter 6 (RVRT AS 6)

AHIMS ID: AHIMS ID 38-4-1879/ 38-4-1916

Site Location: [REDACTED]

Site Extent: 4m by 2m

Site Description: The site consists of five orange IMT artefacts (Figure 163), located [REDACTED] [REDACTED] The site was identified in an area of recent ground disturbance, likely caused by machine plant, which had removed the low grass at an area of approximately 4m by 2m (Figure 164). Soil exposed by the machine cut showed the material to be black-brown soil with rail ballast and ash deposits, and the exposed artefacts were located within 1m of residual Richmond Vale Railway rail line.

Figure 163: Orange IMT complete flakes at RVRT AS 6



Figure 164: Context photo of RVRT AS 6, showing graded machine exposure and rail line. East aspect.



6.4.7 Richmond Vale Rail Trail Isolated Find 7 (RVRT IF7)

AHIMS ID: AHIMS ID 38-4-1887/ 38-4-1921

Site Location: [REDACTED]

Site Description: The site consists of a single grey IMT complete flake (Figure 165), located [REDACTED]. The area where this artefact was identified was located on the top of a vehicle rollover on the access road (Figure 166). The access track in general has been highly disturbed by vehicle tires, road levelling and grading, stormwater erosion and the construction of rollovers to control sediment flows on the access track. The site is located in a highly disturbed context.

Figure 165: Grey IMT complete flake at RVRT IF 7



Figure 166: View of access track rollover, east aspect



6.4.8 Richmond Vale Rail Trail Potential Archaeological Deposit 1 (RVRT PAD 1)

AHIMS ID: AHIMS ID 38-4-1926

Site Location: [REDACTED]

The location and extent of the site are illustrated in Figure 171.

Site Description: The site consists of an area of PAD located [REDACTED] [REDACTED]. The site is level creek terrace at a slightly higher elevation than the adjacent flood plain, consisting of sandy Wallis Creek soil landscape alluvial deposit. The southern boundary of the PAD is defined by the construction of the Richmond Vale Railway embankment (Figure 168). The eastern boundary of the PAD is defined by the edge of the embankment to Wallis Creek.

Ground visibility at the area of PAD is low due to the prevalence of grass cover at the site (Figure 169). However small areas of exposure have shown the underlying sandy alluvial soil formation (Figure 170). Aerial imagery shows that this sandy material is spread widely across the western bank of Wallis Creek, with a meander of the creek delineating the sandy deposit to the north and west.

The extent of this area of PAD is indicative, and likely extends further to the north and west along the level creek terrace. The area of PAD is constrained to the area surveyed during the site inspection. The majority of this area of PAD is located outside of the study area.

Areas of PAD were not identified on other portions of the creek banks at Wallis Creek. On the eastern creek bank, the creek terrace was less than 1m above the creek banks, and showed signs of frequent flooding. To the south of the railway embankment on the western side of Wallis Creek, a residual creek meander was present.

Figure 167: RVRT PAD 1 with open grass area, Wallis Creek in background. South-east aspect



Figure 168: Southern edge of RVRT PAD 1, with rail embankment and Wallis Creek rail bridge in background. East aspect



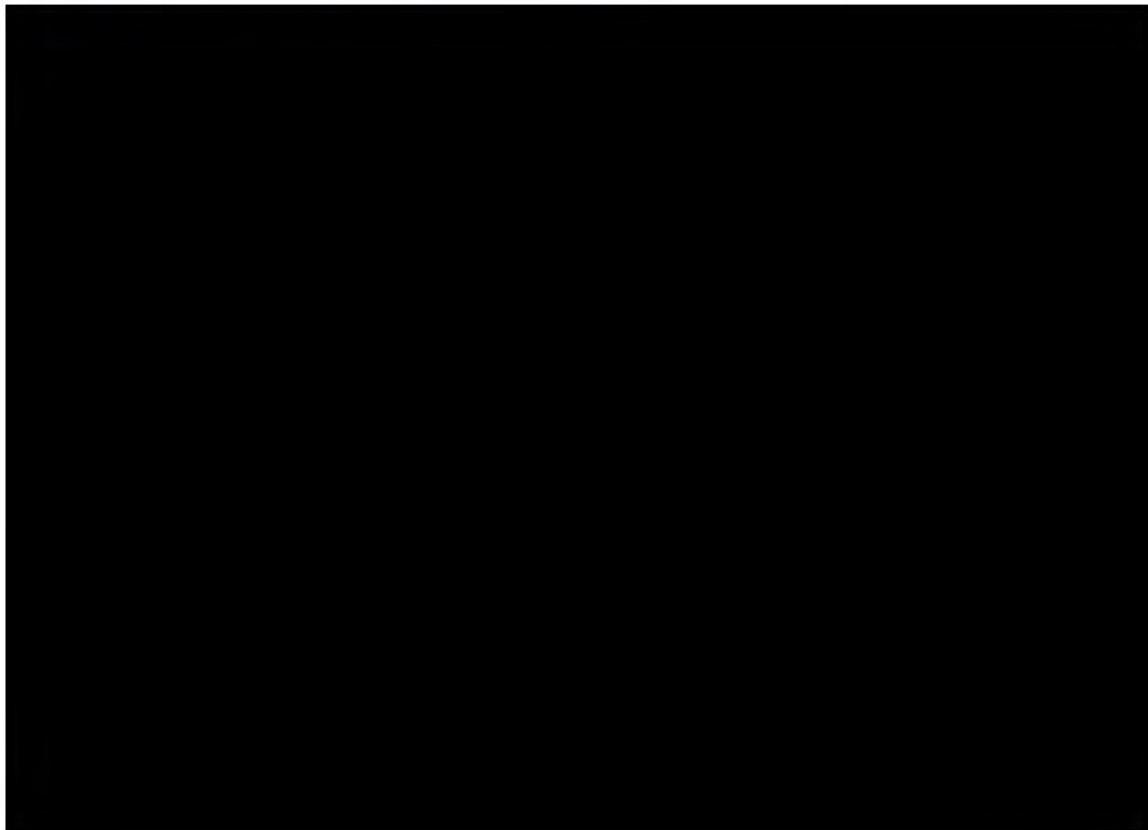
Figure 169: RVRT PAD 1 open grassed area. South aspect



Figure 170: Sandy soil located in erosional ground exposure near base of embankment. South aspect.



Figure 171: Location and extent of RVRT PAD 1



6.4.9 Richmond Vale Rail Trail Isolated Find 8 (RVRT IF8)

AHIMS ID: AHIMS ID 37-6-3806/ 37-6-3834

Site Location: [REDACTED]

Site Description: The site consists of a single coarse-grained yellow-white silcrete complete flake (Figure 172), identified [REDACTED]. The artefact was identified on the access track [REDACTED] (Figure 173).

While the area in which the artefact was located had been previously heavily disturbed by machine grading and levelling, the sand deposit that the artefact was identified in was determined to be intact. The artefact was likely to be derived from underlying sub-surface sands and exposed when machine grading levelled the area. Previous archaeological investigations in the area showed that sub-surface artefacts in Kurri Kurri sand sheets are likely to contain only low density and isolated artefacts.

Figure 172: RVRT PAD 1 open grassed area. South aspect.



Figure 173: Sandy soil located in erosional ground exposure near base of embankment. South aspect.



6.4.10 Richmond Vale Rail Trail Isolated Find 9 (RVRT IF9)

AHIMS ID: AHIMS ID 37-6-3833/ 37-6-3807

Site Location: [REDACTED]

Site Description: The site consisted of a single coarse grained red silcrete flake fragment (Figure 174). The artefact was identified in a cleared area of natural sand, [REDACTED] (Figure 175). The ground surface in this location was largely intact, although nearby access roads had showed signs of moderate ground disturbance from vehicle damage.

Figure 174: Red silcrete artefact from RVRT IF 9



Figure 175: Context photo of RVRT IF 9, south aspect.



6.4.11 Richmond Vale Rail Trail Isolated Find 10 (RVRT IF10)

AHIMS ID: AHIMS ID 37-6-3808/ 37-6-3832

Site Location: [REDACTED]

Site Description: The site consists of a yellow-white coarse grained silcrete complete flake (Figure 176). The artefact had negative flakes and the dorsal surface showed signs of weathering. The site was identified [REDACTED] (Figure 177). The access track had been graded and levelled, with evidence of wheel rutting and erosion damage to the surface. An exposed vertical profile of the nearby soil showed that the vehicle track had been graded up to 20cm into the surrounding sand sheet.

Figure 176: Red silcrete artefact from RVRT IF 9



Figure 177: Context photo of RVRT IF 9, south aspect.



6.4.12 Richmond Vale Rail Trail Isolated Find 11 (RVRT IF11)

AHIMS ID: AHIMS ID 38-4-1925

Site Location: [REDACTED]

Site Description: The site consists of an orange fine-grained IMT complete flake, with maximum dimensions of 54 mm by 48 mm by 16 mm (Figure 178). The artefact had extensive cortical material on its ventral surface, indicative of an early lithic reduction phase of knapping (Figure 179). The isolated find was identified [REDACTED] [REDACTED] (Figure 180).

The isolated artefact was identified within an area of redeposited and laid road gravels and top dressing. To the north and east of the isolated artefact, the ground has been extensively disturbed by vegetation clearance and road grading and maintenance work. The site is located on level ground which used to be located within the intertidal margin of Hexham Swamp, five metres from the edge of a spur crest which descends into the original plain. The pedestrian walkway to the south of the site has been cut into the edge of this spur crest (Figure 181). While it is likely that the artefact has been redeposited in its present location, it is uncertain whether it is indicative of nearby sites located on raised and less disturbed ground.

Figure 178: Orange IMT complete flake, dorsal surface **Figure 179: Orange IMT complete flake, ventral surface showing outer cortical material.**

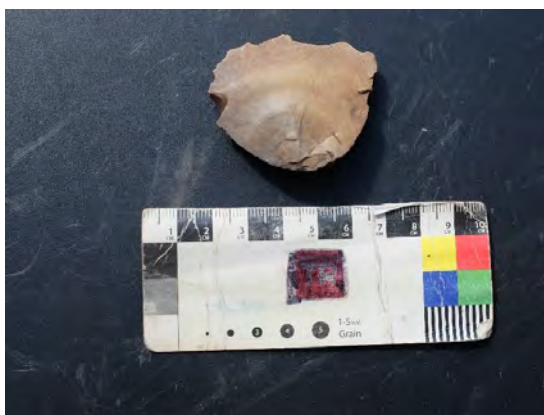


Figure 180: Context photo of site RVRT IF11, north aspect



Figure 181: Edge of spur crest to the south-west of RVRT IF11, showing where pedestrian pathway has been cut into the edge of the original landform. South-west aspect



6.5 Summary of Results

Sites located within the study area are summarised in Table 21.

Sites which were identified during the survey which are located near, but not inside, the study area, are summarised in Table 22.

Table 21: Aboriginal archaeological sites within the study area

Name	AHIMS ID	Description of Site	Survey Unit	Easting	Northing	Site Condition
RVRT AS1 (Part of RVRT AC 1)	38-4-1874/ 38-4-1919	Artefact scatter on exposed ground [REDACTED] extent: 7m x 36m. Ground shows minor erosional disturbance from vehicle and pedestrian tracks.	1	[REDACTED]	[REDACTED]	Fair condition
RVRT IF1 (Part of RVRT AC 1)	38-4-1881/ 38-4-1920	Isolated artefact on exposed ground [REDACTED] Ground shows minor erosional disturbance from vehicle and pedestrian tracks.	1	[REDACTED]	[REDACTED]	Fair condition
RVRT AS2 (Part of RVRT AC 1)	38-4-1875/ 38-4-1918	Artefact scatter on exposed ground [REDACTED] extent: 9m x 5m. Ground shows minor erosional disturbance from vehicle and pedestrian tracks.	1	[REDACTED]	[REDACTED]	Fair condition
RVRT AS3 (Part of RVRT AC 1)	38-4-1876/ 38-4-1917	Artefact scatter on exposed ground [REDACTED] extent: 3m x 4m. Ground shows minor erosional disturbance from vehicle and pedestrian tracks.	1	[REDACTED]	[REDACTED]	Fair condition
RVRT IF2	38-4-1882/ 38-4-1910	Isolated artefact identified with shell material in sandy deposit, located in imported sandy material over newly constructed drainage culvert.	5	[REDACTED]	[REDACTED]	Poor condition, disturbed context
RVRT IF3	38-4-1883/ 38-4-1922	Isolated artefact identified [REDACTED]	5	[REDACTED]	[REDACTED]	Poor condition, disturbed context
Hexham Swamp 2A (HS2A)	38-4-1583	AHIMS artefact site, not relocated during survey. Site location presently [REDACTED]	5	[REDACTED]	[REDACTED]	Site likely destroyed for road construction
RVRT AS 7	38-4-1880/ 38-4-1923	Archaeological site [REDACTED] [REDACTED] [REDACTED] Surface artefacts located in areas of shallow erosional ground disturbance, although wider landform largely intact. Extent: 160m x 10m.	7	[REDACTED]	[REDACTED]	Good condition

Name	AHIMS ID	Description of Site	Survey Unit	Easting	Northing	Site Condition
RVRT IF4 (Seahampton Road Site)	38-4-1884/ 38-4-1913	Isolated artefact identified [REDACTED] [REDACTED] Road level excised below level of surrounding hill terrain, indicating a non-natural ground surface.	10	[REDACTED]	[REDACTED]	Poor condition, disturbed context
RVRT AS4 (Seahampton Road Site)	38-4-1877/ 38-4-1915	Artefact scatter identified in [REDACTED] [REDACTED] Road level excised below level of surrounding hill terrain, indicating a non-natural ground surface. Extent: 82m x 9m.	10	[REDACTED]	[REDACTED]	Poor condition, disturbed context
RVRT AS5 (Seahampton Road Site)	38-4-1878/ 38-4-1912	Artefact scatter identified in [REDACTED] [REDACTED] Road level excised below level of surrounding hill terrain, indicating a non-natural ground surface. Extent: 3m x 3m.	10	[REDACTED]	[REDACTED]	Poor condition, disturbed context
RVRT AS6	38-4-1879/ 38-4-1916	Artefact scatter identified in surface exposure [REDACTED] [REDACTED] Likely redeposited in this area. Extent: 4m x 2m.	10	[REDACTED]	[REDACTED]	Poor condition, disturbed context
Blue Gum Creek RTA IF4	38-4-1348	Isolated artefact located [REDACTED] [REDACTED] Site was not relocated during the survey.	10	[REDACTED]	[REDACTED]	Poor condition, disturbed context
RVRT IF7	38-4-1887/ 38-4-1921	Isolated artefact identified [REDACTED] [REDACTED]	11	[REDACTED]	[REDACTED]	Poor condition, disturbed context
Blue Gum Creek Artefact Scatter 2	38-4-0761	Artefact scatter located [REDACTED] [REDACTED] Site was not relocated during the survey.	11	[REDACTED]	[REDACTED]	Poor condition, disturbed context
RVRT PAD 1	38-4-1926	Area of PAD [REDACTED] [REDACTED] PAD extent: 50m x 25m.	13	[REDACTED]	[REDACTED]	Good condition
RVRT IF8	37-6-3806/ 37-6-3834	Isolated artefact identified [REDACTED] [REDACTED] Surface disturbance has exposed sandy sub-surface deposit including isolated artefact.	14	[REDACTED]	[REDACTED]	Fair condition

Name	AHIMS ID	Description of Site	Survey Unit	Easting	Northing	Site Condition
RVRT IF10	37-6-3808/ 37-6-3832	Isolated artefact identified [REDACTED] Moderate shallow ground disturbance from vehicle and erosional damage.	15	[REDACTED]	[REDACTED]	Fair condition
RVRT IF11	38-4-1925	Isolated artefact identified [REDACTED] in area of reclaimed vegetation and clear ground disturbance. Likely imported to its present location from nearby soil materials.	16	[REDACTED]	[REDACTED]	Fair condition, disturbed context

Table 22: Newly identified Aboriginal archaeological sites located near the study area

Name	AHIMS# (if listed)	Description of Site	Survey Unit	Easting	Northing	Site Condition
RVRT IF5	38-4-1885/ 38-4-1921	Isolated artefact (machine broken) located [REDACTED] Minimal shallow ground disturbance from vehicle damage.	10	[REDACTED]	[REDACTED]	Fair condition
RVRT IF6 (Seahampton Road Site)	38-4-1886/ 38-4-1911	Isolated artefact identified [REDACTED] Road level excised below level of surrounding hill terrain, indicating a non-natural ground surface.	10	[REDACTED]	[REDACTED]	Poor condition, disturbed context
RVRT IF9	37-6-3833/ 37-6-3807	Isolated artefact site identified in exposure in regrowth vegetation, [REDACTED] Minimal ground disturbance in natural sandy deposit.	15	[REDACTED]	[REDACTED]	Good condition

7.0 ANALYSIS AND DISCUSSION

7.1 Distribution of Aboriginal Sites and Archaeologically Sensitive Landforms

The study area includes a number of identified Aboriginal sites and areas of archaeological potential. Overall, the natural landforms that the study area traverses are generally intact, a high degree of disturbance is associated with the study area due to its association with the former alignment of the Richmond Vale Railway and the Hunter Water pipeline through Hexham Swamp.

This section will provide a brief discussion on the distribution of Aboriginal sites identified during the survey, based on the landscape of each individual area.

7.1.1 Margins of Hexham Swamp

Hexham Swamp was a source of abundant plant and animal resources for Aboriginal people, before the wetlands were partially drained and converted into pasturage for European animals. A large number of archaeological assessments, particularly based around the spur crests that descend into Hexham Swamp have revealed that the areas bordering the swamp are archaeologically highly sensitive. AHIMS data confirms this distribution of sites throughout these areas.

One large artefact scatter (RVRT AS 7) and a widespread archaeological complex (RVRT AC 1) were located on the hill crests on the land bordering Hexham Swamp. Site RVRT AS 7 was located at the break of slope directly above the edge of Hexham Swamp in the suburb of Fletcher. RVRT AC 1 was located further away from Hexham Swamp, however it was located on the central ridge crest of spur crest in Shortland, and was less than 150m distance from the margin of the wetland.

Isolated artefact find RVRT IF 3 was also located on a spur crest that was located close to Hexham Swamp, in the suburb of Tarro. It is likely that the isolated artefact was originally local to this spur crest above the swamp, however the construction of Anderson Drive and subsequent disturbance makes it difficult to ascertain the provenance of the artefact.

7.1.2 Hexham Swamp

While the Hexham wetlands were an abundant plant and animal resource for Aboriginal people, the shifting estuarine clays and periodic inundation of the landscape mean that the preservation and identification of Aboriginal objects within the lower estuarine landscape is considered unlikely. The archaeological potential to identify Aboriginal objects in the swamp close to the study area is considered nil to low.

One site recovered from this landscape (RVRT IF 2) was considered an imported artefact (see Section 7.1.6 below). Few AHIMS sites were identified in the swamp itself, and even then, these sites were identified in the upper sloping margins to the north near Tarro which were less likely to be permanently inundated.

7.1.3 Foothills of Mount Sugarloaf and Black Hill

A large number of artefact, grinding groove sites and areas of PAD have been previously identified in the moderate relief topography of the foothills of Mount Sugarloaf and Black Hill. Ridgelines and spur crests that ascend to the top of Mount Sugarloaf and Black Hill were used as pathways for Aboriginal people to travel across country, as well as routes to the important spiritual places on and near the

Mount Sugarloaf and Black Hill summits. Creek valleys to the north-west of the Mount Sugarloaf, particularly the Blue Gum Creek valley, are viewed as archaeologically sensitive.

The alignment of the former Richmond Vale Railway line largely adheres to the sides of these crests, running parallel to the ridge line at the approximate mid-slope for much of its traverse through these foothills. While the AHIMS data reflects the archaeological sensitivity of this region, the former railway line pathway has caused extensive ground disturbance across this portion of the study area.

Identified archaeological sites in relatively undisturbed contexts were infrequent, largely due to the confinement of the study area to the alignment of the former railway line. Two identified sites (IF 5 and IF 7) were located during the survey within these foothills.

Site RVRT IF 5 (20m east of Survey Unit 10) is located in a moderately shallow-disturbed ground context, in a ground exposure caused by vehicle traffic. The site was surrounded by thick and partially weedy regrowth vegetation on both sides of the vehicle track. The site was located at the mid-slope of a gentle ridge line.

Site RVRT IF 7 was located in the centre of an access track, within 10m of the footprint of the former Richmond Vale Railway. The site was located on an artificial rollover on the vehicle access track, in local soils. While it is likely that the artefact was deposited locally, due to the clear degree of artificial disturbance at the site, the exact provenance of the artefact is unclear.

AHIMS artefact sites within the study area (Blue Gum Creek RTA IF 4 and Blue Gum Creek Artefact Scatter 2) were not able to be re-identified, due to the heavy degree of erosion and ground disturbance in the locations of these sites. As the foothills of Mount Sugarloaf and Black Hill are relatively thickly vegetated (particularly with re-growth understory and weeds), the primary areas of visibility are on the numerous vehicle access tracks through the vicinity. These access tracks have been heavily damaged both by mining machinery (for the nearby collieries and quarries) as well as by four-wheel drive vehicles. Due to the moderate degree of the slope, the removal of vegetation and damage from vehicles, severe erosion has reduced the natural soil profiles in these areas to a skeletal, sometimes entirely absent, state. This is further compounded by infilled sediment, caused both by colluvial wash-ins as well as the importation of material to stabilise the road subgrade, both of which often obscure the natural ground surface.

7.1.4 Surveyors Creek and Wallis Creek Valleys

AHIMS site distribution in the areas between the eastern end of the Surveyors Creek valley and the western end of the Wallis Creek valley, shows a small number of sites distributed on the higher elevation profiles that descend from the east. Only a small number of artefact sites were identified in close proximity to the lower courses of Wallis and Surveyors Creek from the AHIMS search.

The low-lying banks of Surveyors and Wallis Creeks are not expected to be of high or widespread archaeological sensitivity. The low-lying, courses of these creeks including billabongs, as well as the surrounding plain are likely to be susceptible to seasonal flooding, reducing the likelihood that Aboriginal sites could be archaeologically observed in these areas.

One area of PAD (the RVRT PAD 1) was identified on the banks of Wallis Creek, on a natural level embankment of slightly higher elevation to the creek than the surrounding floodplain. This area consists of a raised and relatively level intact sand sheet that extends between Wallis Creek and a former meander to the west of the main channel.

7.1.5 Kurri Kurri Sand Deposits

Natural sand deposits, located to the south-east of Kurri Kurri and Pelaw Main, stretch for several kilometres from the higher elevation of those towns towards the western edge of the Wallis Creek valley. Previous archaeological investigations in this Neath and Heddon Greta soil landscape to the west and south-west of Kurri Kurri have shown that these sand deposits can be over 1m in depth, and potentially artefact bearing throughout the vertical profile.

Three Aboriginal sites were identified within this sand sheet – RVRT IF 8, RVRT IF 9 and RVRT IF 10. Two of these sites, RVRT IF 8 and RVRT IF 10, were located at up to 20cm depth from the natural sand sheet ground surface. The sand deposits in this region are located close to several sources of fresh water. Archaeological investigations by ERM for the Hunter Economic Zone project (ERM 2003) showed that only a low quantity of artefacts were recovered from sand sheets near Kurri Kurri. To the result of these previous investigations, as well as the isolated finds' relatively widespread distribution over the study area, implies that the archaeological potential for higher density artefact deposits is low. Additionally, the ground surface of the former rail alignment has been significantly mixed.

7.1.6 Imported Aboriginal Objects

A number of Aboriginal sites identified during the site inspection were located in contexts that strongly implied the artificial importation of Aboriginal objects during landscaping activities during construction of railway or road easements. The most conspicuous of these sites – the Seahampton Road Sites – was located over a wide area of an unsealed and graded road, on relatively level ground which had been cut into and below the surrounding hills. Artefacts had been distributed across the road surface with non-artefactual gravels.

Another site, RVRT IF 2, was identified in imported sand, in association with shell material, which had been laid over a newly installed concrete drainage culvert on an access track. A further artefact scatter site (RVRT AS 6) was identified within an ashy soil context associated with fill materials used to construct the level embankment for the former Richmond Vale Railway.

The isolated find site RVRT IF11 was identified in imported sand and gravel materials, on the margins of Hexham Swamp within five metres of a partially intact spur crest. It is likely that the artefact has been imported from the immediate area, however this cannot be confirmed. Due to its likely imported location, the site does not demonstrate any further archaeological potential.

These sites do not show any meaningful relationship with Aboriginal site distribution in the wider Hunter area due to their location within imported fill.

7.2 Previous Ground Disturbance

The study area is largely confined to the footprint of former rail and water infrastructure. Survey Units 2, 3, 4 and 5 are largely co-incident with the footprint of the former Hunter Water pipeline through Hexham Swamp. Although Survey Unit 16 is located on the potentially archaeologically sensitive margin of Hexham Swamp, the survey unit is in an area which has been heavily modified and reclaimed from the swamp in historical times. Survey Units 6, 8 and 9 – 15 are almost entirely located within the former footprint of the Richmond Vale Railway. These alignments are mostly either constructed embankments or below ground level cuttings. In both situations, the ground surface in the study area is a non-natural ground surface.

Furthermore, since the decommissioning of the Hunter Water pipeline and Richmond Vale Railway, the level and straight alignment of these items of former infrastructure have been largely re-purposed

as vehicle access roads. Where rail beams have been removed from the alignment, often significant removal of the former sub-grade and sub-surface material has been involved, reducing the potential to recover natural and intact ground surfaces. In addition, these ground disturbances have heavily impacted the lower A horizons of many of the soil profiles, meaning that sub-surface artefact deposits would have also been altered or destroyed.

The study area is relatively narrow (between 5m and 10m) and largely adheres to these alignments. Areas which are located outside of these alignments include:

- The upper hill surfaces of excavated rail cuttings, adjacent to the rail cuttings themselves. While these areas do exhibit natural ground surfaces, in many places disturbance from the construction of drainage lines, fence posts and vehicle access tracks have reduced their archaeological potential.
- Spur crests in Shortland, Fletcher and Minmi. In those areas which had not been landscaped for the installation of the former railway line and Hunter Water pipeline, Aboriginal sites were identified.
- Wallis and Surveyor Creek banks and flood zones. While livestock on pastoral properties has caused some disturbance along the banks of these larger fresh water courses, their creek banks are predominantly disturbed by periodic flood events. Those areas above the flood zone would be considered to be only minimally ground disturbed.
- Secondary access tracks through the Kurri Kurri sandy landscape. While ground disturbance from vehicle traffic can be severe it is also not uniform throughout the landscape. Off the main rail alignment, the ground is only moderately disturbed to shallow depths (less than 20cm) from vehicle access roads.

7.3 Archaeological Potential

A number of natural landforms within the study area have been identified as potentially archaeologically sensitive, including:

- Spur crests and ridgelines of hills that border Hexham Swamp
- Margins of water courses which are above the flood zone
- Spur crests, ridge lines and hill saddles that are connected to Mount Sugarloaf and Black Hill
- Sand deposits which are located near freshwater courses (in the Werakata SCA)

Despite the potentially high archaeological sensitivity of these natural landforms throughout the study area, the level of ground disturbance caused by construction of the former Richmond Vale Railway, and the confinement of most of the study area to that area of disturbance, means that the level of archaeological potential across the whole of the study area is considered to be low.

As such, Aboriginal archaeological potential has been identified in only relatively undisturbed areas, or in areas of only shallow ground disturbance. These areas are located away from this original rail alignment. Areas of archaeological potential that require further investigation, such as test excavation, are identified in the following locations:

- Sections of RVRT Archaeological Complex 1
- RVRT AS 7
- RVRT PAD 1

8.0 SIGNIFICANCE ASSESSMENT

8.1 Significance Assessment Criteria

Archaeological significance refers to the archaeological or scientific importance of a landscape or area. This is characterised by using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the study area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

8.2 Archaeological Significance Assessment

The archaeological significance of the sites recorded within the study area has been assessed by observations made during the site survey, previous investigations in the region as well as the landscape and archaeological context of the study area.

Sites which have been determined to have more than low archaeological significance are discussed in the following sections. A summary of the archaeological significance of all the sites in the study area is provided in Table 23.

8.2.1 Richmond Vale Rail Trail Archaeological Complex 1 (RVRT AC 1)

A number of sites located in the only shallow-disturbed ground were identified [REDACTED]. These sites were located [REDACTED]. Despite the moderate level of disturbance from the construction of King Street and from the parallel alignment of the former Hunter Water pipeline, a 6 to 8m wide portion of the ground surface appeared to be relatively undisturbed between these service and infrastructure corridors.

Spur crests that fringe Hexham Swamp are known to have yielded relatively high densities of Aboriginal artefactual material. Archaeological investigations for new housing estates have yielded relatively high volumes, although the majority of recent investigations have focussed on the surface collection of artefacts. The moderately deep (up to 30cm) soil profile in the area of the Shortland ridge crest could indicate intact and stratified archaeological deposits in this area, related to occupation areas associated with resource gathering in Hexham Swamp.

As further investigation of certain areas within RVRT Archaeological Complex 1 will be required to determine the nature and extent of archaeological material in this area, the site complex is indicatively assessed as demonstrating moderate archaeological significance.

8.2.2 Richmond Vale Rail Trail Artefact Scatter 7 (RVRT AS 7)

Site RVRT AS 7 was identified based on the presence of surface artefacts [REDACTED]. A small number of exposures revealed surface artefacts in moderate densities. The area between the break of slope and the newly installed pedestrian pathway showed relatively minor ground disturbance. Any occupation area located along this ridge line would have been within easy access of resources from an upper freshwater portion of Hexham Swamp.

An AHIMS listed site is located [REDACTED] RVRT AS 7 (Sanctuary – Estate Stage 4B Fletcher, AHIMS ID 38-4-1519). Due to the recent construction of the housing development in this area, and the listing of this site, it is possible that the newly identified RVRT AS 7 may be part of the originally recorded extent of AHIMS# 38-4-1519.

As further investigation of RVRT AS 7 will be required to determine the nature and extent of archaeological material in this area, the site is indicatively assessed as demonstrating moderate archaeological significance.

8.2.3 Richmond Vale Rail Trail Potential Archaeological Deposit 1 (RVRT PAD 1)

The area around Wallis Creek, prior to European settlement, was partially wetland surrounding slow moving freshwater creeks and meanders. A level and relatively high-elevation sand deposit is located [REDACTED].

This location would have been elevated above the surrounding water courses except for during period of high flooding. Dense grass cover obscured the ground surface, however the proximity of fresh water to an intact sand body could indicate the presence of sub-surface Aboriginal objects.

The archaeological significance of the RVRT PAD 1 is uncertain, and this archaeological significance can only be ascertained through test excavation.

8.2.4 Sites with Low Overall Archaeological Significance

The remainder of the sites located within the study area were considered to be of nil or low archaeological significance. Sites which were classified as nil significance included the site that has demonstrably been destroyed (AHIMS ID 38-4-1583).

Sites classified as having low archaeological significance were those that were located in highly disturbed contexts, or that were shown to be artificially imported to their present location. Due to the displaced and disturbed contexts of these sites, it was determined that archaeological excavation for further sub-surface deposits would fail to yield artefacts in controlled archaeological contexts.

8.3 Cultural Significance

The Aboriginal cultural heritage values associated with the study area will be discussed by Aboriginal stakeholders in their written responses to this report.

Table 23: Archaeological significance assessment for sites within the study area

Site Type	Site Name	Condition	Survey Unit	Research Potential	Scientific Value	Representative Value	Rarity	Overall Archaeological Significance
Richmond Vale Rail Trail Archaeological Complex 1 <i>Indicative assessment of significance</i>	RVRT AS1	Fair condition	1	Moderate	Moderate	Low	Moderate	Moderate
	RVRT IF1	Fair condition	1	Moderate	Moderate	Low	Low	Moderate
	RVRT AS2	Fair condition	1	Moderate	Moderate	Low	Low	Moderate
	RVRT AS3	Fair condition	1	Moderate	Moderate	Low	Low	Moderate
Isolated Find	RVRT IF2	Poor condition, disturbed context	5	Nil	Low	Low	Low	Low
Isolated Find	RVRT IF3	Poor condition, disturbed context	5	Low	Low	Low	Low	Low
AHIMS Site	Hexham Swamp 2A (HS2A)	Removed for road construction	5	Nil	Nil	Nil	Low	Nil
Artefact Scatter <i>Indicative assessment of significance</i>	RVRT AS 7	Good condition	7	Moderate	Moderate	Low	Low	Moderate
	RVRT IF4	Poor condition, disturbed context	10	Low	Low	Low	Low	Low
Seahampton Road Sites (Artificially Imported Aboriginal Objects)	RVRT AS4	Poor condition, disturbed context	10	Low	Low	Low	Low	Low
	RVRT AS5	Poor condition, disturbed context	10	Low	Low	Low	Low	Low
	RVRT IF6	Poor condition, disturbed context	10	Low	Low	Low	Low	Low

Site Type	Site Name	Condition	Survey Unit	Research Potential	Scientific Value	Representative Value	Rarity	Overall Archaeological Significance
Isolated Find	RVRT IF5	Poor condition, disturbed context	10	Low	Low	Low	Low	Low
Artefact Scatter	RVRT AS6	Poor condition, disturbed context	10	Low	Low	Low	Low	Low
AHIMS Site	Blue Gum Creek RTA IF4	Poor condition, disturbed context	10	Low	Low	Low	Low	Low
Isolated Find	RVRT IF7	Poor condition, disturbed context	11	Low	Low	Low	Low	Low
AHIMS Site	Blue Gum Creek Artefact Scatter 2	Poor condition, disturbed context	11	Low	Low	Low	Low	Low
Potential Archaeological Deposit	RVRT PAD 1	Good condition	13	Moderate	Moderate	Low	Low	<i>Unknown</i>
Isolated Find	RVRT IF8	Fair condition	14	Low	Low	Low	Low	Low
Isolated Find	RVRT IF9	Fair condition	15	Low	Low	Low	Low	Low
Isolated Find	RVRT IF10	Fair condition	15	Low	Low	Low	Low	Low
Isolated Find	RVRT IF11	Poor condition, disturbed context	16	Low	Low	Low	Low	Low

9.0 IMPACT ASSESSMENT

The Proposal involves the construction of a 3m wide shared pathway that generally follows the alignment of the former Richmond Vale Railway. Sites that are located directly within the footprint of the new shared pathway, or 'clearance boundary', would be considered to suffer direct impacts, due to ground disturbing works and excavation associated with the installation of the new pathway.

Examples of activities within the clearance boundary include:

- construction of the shared pathway
- grading and levelling of unsafe cuttings
- machine removal of vegetation
- general levelling and clearing of terrain
- installation of ancillary structures such as benches, lighting and bathroom amenities
- preparation of creek banks for the construction of new or repaired bridges
- construction of stormwater drainage utilities.

Any portion of an identified Aboriginal site or area of archaeological potential within the clearance boundary will be impacted.

A wider 'disturbance boundary' has been delineated, within which a number of activities associated with works in the clearance boundary will occur. These activities include laydown and stockpiling areas, as well as vehicular and machine access. Although these activities will not result in direct impacts to the ground surface throughout the entirety of the disturbance boundary, there is potential for impacts associated with metal tracked machinery, vehicular movements in wet weather, and increased erosion/ compaction of archaeological sites from compound and stockpile areas.

Due to the ancillary nature of the activities within the disturbance footprint, there is the potential for avoiding impact to Aboriginal sites in those areas. As such, the impact assessment for those sites within the disturbance boundary is subject to confirmation once the nature and location of ancillary activities in those areas is known.

No indirect impacts are anticipated from the proposed works.

A summary of impacts to Aboriginal sites in the study area is provided in Table 24.

Table 24: Impact assessment of sites within the study area

Site Type	Site Name	Survey Unit	Disturbance/ Clearance Boundary	Type of Harm	Degree of Harm	Consequence of Harm
Richmond Vale Rail Trail Archaeological Complex 1 (test excavation require to confirm level of impacts)	RVRT AS1	1	Disturbance	Direct	Partial	Partial Loss of Value
	RVRT IF1	1	Disturbance	Direct	Total	Total Loss of Value
	RVRT AS2	1	Disturbance	Direct	Total	Total Loss of Value
	RVRT AS3	1	Clearance/ Disturbance	Direct	Total	Total Loss of Value
Isolated Find	RVRT IF2	5	Disturbance	Direct	Total	Total Loss of Value
Isolated Find	RVRT IF3	5	No longer in study area	None	None	No Loss of Value
AHIMS Site	Hexham Swamp 2A (HS2A)	5		Direct	None (site already destroyed)	No loss of value (site already destroyed)
Artefact Scatter	RVRT AS 7	7	Clearance/ Disturbance	Direct	Partial	Partial Loss of Value (test excavation required to confirm level of impacts)
	RVRT IF4	10	Clearance	Direct	Total	Total Loss of Value
Seahampton Road Sites (Artificially Imported Aboriginal Objects)	RVRT AS4	10	Clearance/ Disturbance	Direct	Total	Total Loss of Value
	RVRT AS5	10	Clearance	Direct	Total	Total Loss of Value
	RVRT IF6	10	Not located in study area	None	None	No Loss of Value
Isolated Find	RVRT IF5	10	Not located in study area	None	None	No Loss of Value
Artefact Scatter	RVRT AS6	10	Not located in study area	None	None	No Loss of Value
Isolated Find	RVRT IF7	11	Not located in study area	None	None	No Loss of Value

Site Type	Site Name	Survey Unit	Disturbance/ Clearance Boundary	Type of Harm	Degree of Harm	Consequence of Harm
Potential Archaeological Deposit	RVRT PAD 1	13	Disturbance	Direct	Partial	Partial Loss of Value (test excavation required to confirm level of impacts)
Isolated Find	RVRT IF8	14	Clearance	Direct	Total	Total Loss of Value
Isolated Find	RVRT IF9	15	Not located in study area	None	None	No Loss of Value
Isolated Find	RVRT IF10	15	Disturbance	Direct	Total	Total Loss of Value
Isolated Find	RVRT IF11	16	Disturbance	Direct	Total	Total Loss of Value

10.0 MANAGEMENT AND MITIGATION MEASURES

10.1 Guiding principles

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites should be conserved. If conservation is not practicable, measures should be taken to mitigate against impacts to Aboriginal sites.

The nature of the mitigation measures recommended is based on the assessed significance of the site or sites and the assessed archaeological sensitivity for areas in which the sites are located. The final recommendations would also be informed by cultural significance, which will be discussed by the Aboriginal stakeholders in their report on the results of the field survey.

10.2 Avoiding Impacts to Sites

Based on current designs, the proposal would cause ground-disturbing impacts to the following identified Aboriginal sites:

- RVRT AS1 (AHIMS ID 38-4-1874/ 38-4-1919)
- RVRT IF1 (AHIMS ID 38-4-1881/ 38-4-1920)
- RVRT AS2 (AHIMS ID 38-4-1875/ 38-4-1918)
- RVRT AS3 (AHIMS ID 38-4-1876/ 38-4-1917)
- RVRT IF2 (AHIMS ID 38-4-1882/ 38-4-1910)
- RVRT IF3 (AHIMS ID 38-4-1883/ 38-4-1922)
- RVRT AS 7 (AHIMS ID 38-4-1880/ 38-4-1923)
- RVRT IF4 (AHIMS ID 38-4-1884/ 38-4-1913)
- RVRT AS4 (AHIMS ID 38-4-1877/ 38-4-1915)
- RVRT AS5 (AHIMS ID 38-4-1878/ 38-4-1912)
- RVRT AS6 (AHIMS ID 38-4-1879/ 38-4-1916)
- RVRT PAD 1 (AHIMS ID 38-4-1926)
- RVRT IF8 (AHIMS ID 37-6-3806/ 37-6-3834)
- RVRT IF10 (AHIMS ID 37-6-3808/ 37-6-3832)
- RVRT IF11 (38-4-1925)
- HS2A (AHIMS ID 38-4-1583)

The following sites are immediately outside the study area and will not be impacted:

- RVRT IF5 (38-4-1885/ 38-4-1921)
- RVRT IF6 (AHIMS ID 38-4-1886/ 38-4-1911)
- RVRT IF7 (38-4-1887/ 38-4-1921)
- RVRT IF9 (37-6-3833/ 37-6-3807)

The study area boundary has been modified since the archaeological survey was conducted, resulting in removal of impacts to RVRT IF 3.

10.2.1 Clarification of impacts within the disturbance boundary

The location and extent of potential impacts to identified sites within the disturbance boundary should be determined through detailed design and finalisation of constructability documentation. There is the potential to avoid impact to recorded Aboriginal sites within the disturbance boundary by relocating the location of vehicle access and ancillary facilities, for example.

10.3 Aboriginal Stakeholder Consultation

Comprehensive Aboriginal stakeholder consultation, carried out in accordance with the OEH 'Aboriginal cultural heritage consultation requirements for proponents 2010', should commence for the project.

This process will include a process prescribed in the OEH guidelines for identifying and inviting Aboriginal stakeholders to register for consultation, including placing an advertisement in a local newspaper(s), writing to certain government agencies, and inviting stakeholders to register.

10.4 Archaeological Test Excavation

Three areas have been identified with moderate archaeological potential and archaeological significance. Should these sites be impacted by the proposed works, archaeological test excavation, under OEH code of practice, would be required. Areas where archaeological test excavation is recommended include:

- RVRT Archaeological Complex 1
- RVRT AS 7
- RVRT PAD 1

The scope of archaeological test excavation at each location, particularly RVRT Archaeological Complex 1, and RVRT PAD 1, would require clarification once the extent of proposed works in those areas is known. Test excavation at RVRT Archaeological Complex 1 would focus on undisturbed areas within the site complex that will be impacted.

Test excavation would require comprehensive consultation with Aboriginal stakeholders in accordance with the OEH consultation requirements (see Section 10.3). The preparation of a test excavation methodology would be required, which would then be submitted to registered Aboriginal stakeholders for a period of 28 days for comment. Following this 28 day period, the excavation methodology would be submitted to OEH no less than 14 days prior to the commencement of test excavation. Following test excavation, a report to assess the finds and archaeological significance of the above sites would be prepared. That report would be appended to the ACHAR and AHIP application, where required. The location of test pits would include placement of pits around, and outside, the identified boundaries site/ PAD boundaries to determine the sub-surface extent of the site.

10.5 Impact to Aboriginal Sites

Should it not be feasible to avoid sites listed in Section 10.2 during works, an Aboriginal Heritage Impact Permit (AHIP) would be required prior to the commencement of any ground disturbing works. This would involve the preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR) in accordance with the relevant OEH guidelines. In order to prepare this ACHAR, full consultation with Aboriginal stakeholders would need to occur (see Section 10.3), in order to ascertain the cultural heritage values of the identified sites and study area as a whole. Consultation with Aboriginal

stakeholder groups would occur under provisions outlined in the relevant OEH guidelines, and would involve mandated periods for stakeholders to review and provide input into the ACHAR.

10.6 Further Archaeological Survey

The study area boundary has been adjusted since archaeological survey was conducted for this assessment. As such, any portion of the clearance and/ or disturbance boundary outside the original investigation area should be subject to further archaeological survey. Where there are no impacts proposed within the additional areas, a heritage consultant will advise if further field survey is required.

A review of the survey maps and current project area boundary, as well as clarification of impacts, should be undertaken to determine where further archaeological survey will be required.

10.7 Changes to the Study Area Boundary

The study area is predominantly limited to areas defined by the alignment of the former Richmond Vale Railway Line and the former Hunter Water pipeline through Hexham Swamp. Both of these items are resting on relatively wide (between 8 and 12m) artificial embankments or through artificial cuts through the landscape.

Due to the archaeologically sensitive nature of many areas bordering the study area, further archaeological investigation would be required should any aspect of the proposal go outside the area investigated for the archaeological survey.

10.8 Protection of Aboriginal Sites During Works and Unexpected Finds

An Aboriginal Heritage Management Plan (AHMP) should be prepared prior to commencement of works to delineate the location of Aboriginal sites, or portions of Aboriginal sites, within the study area. Where Aboriginal sites, or portions of Aboriginal sites, are located outside the proposed extent of impacts, those areas should be clearly identified as no-harm areas in order to remove the possibility of inadvertent impact.

Several Aboriginal sites are located in close proximity to the study area boundary. As those sites were identified using a hand-held GPS, a surveyor may be required to clearly indicate the location of the study area on the ground in relation to the recorded site location. This will assist with determining impacts and establishing no-harm areas.

The AHMP should include an unexpected finds procedure for the proposed works, including details of required Aboriginal stakeholder consultation, identification of the nature and extent of unexpected finds, and any reporting or permits that may be required prior to works recommencing.

11.0 RECOMMENDATIONS

11.1 Conclusion

Based on current designs, the proposal would cause ground-disturbing impacts to the following identified Aboriginal sites:

- RVRT AS1 (AHIMS ID 38-4-1874/ 38-4-1919)
- RVRT IF1 (AHIMS ID 38-4-1881/ 38-4-1920)
- RVRT AS2 (AHIMS ID 38-4-1875/ 38-4-1918)
- RVRT AS3 (AHIMS ID 38-4-1876/ 38-4-1917)
- RVRT IF2 (AHIMS ID 38-4-1882/ 38-4-1910)
- RVRT IF3 (AHIMS ID 38-4-1883/ 38-4-1922)
- RVRT AS 7 (AHIMS ID 38-4-1880/ 38-4-1923)
- RVRT IF4 (AHIMS ID 38-4-1884/ 38-4-1913)
- RVRT AS4 (AHIMS ID 38-4-1877/ 38-4-1915)
- RVRT AS5 (AHIMS ID 38-4-1878/ 38-4-1912)
- RVRT AS6 (AHIMS ID 38-4-1879/ 38-4-1916)
- RVRT PAD 1 (AHIMS ID 38-4-1926)
- RVRT IF8 (AHIMS ID 37-6-3806/ 37-6-3834)
- RVRT IF10 (AHIMS ID 37-6-3808/ 37-6-3832)
- RVRT IF11 (38-4-1925)
- HS2A (AHIMS ID 38-4-1583)

The following sites are immediately outside the study area and will not be impacted:

- RVRT IF5 (38-4-1885/ 38-4-1921)
- RVRT IF6 (AHIMS ID 38-4-1886/ 38-4-1911)
- RVRT IF7 (38-4-1887/ 38-4-1921)
- RVRT IF9 (37-6-3833/ 37-6-3807)

The study area boundary has been modified since the archaeological survey was conducted, resulting in removal of impacts to RVRT IF 3.

11.2 Recommendations and Mitigation Measures

Table 25: Overview of recommendations and mitigation measures

Development	Discussion
Approvals	<p>Should it not be possible to avoid impacting Aboriginal sites during design and construction works, an AHIP is required prior to impacts. This AHIP application must be submitted to OEH with an Aboriginal Cultural Heritage Assessment Report (ACHAR). Full consultation with Aboriginal stakeholders in accordance with the OEH consultation requirements would need to be conducted.</p> <p>Archaeological test excavation, where required, would need to take place prior to the AHIP application being submitted.</p> <p>An impact assessment would need to be prepared for any early works that result in ground disturbance, such as geotechnical investigation, to determine if an AHIP would be required prior to early works commencing.</p>
Avoidance of impact	<p>Detailed design for the proposal should avoid impacting identified Aboriginal sites.</p>
Clarification of impacts	<p>The location and extent of potential impacts to identified sites within the disturbance boundary should be determined through detailed design and finalisation of constructability documentation. There is the potential to avoid impact to recorded Aboriginal sites within the disturbance boundary by relocating the location of vehicle access and ancillary facilities, for example.</p> <p>A number of recorded Aboriginal sites are located in close proximity to the study area. Following clarification of the location and extent of impacts within the study area, a consistency check, or update to this report, must be undertaken that identifies all recorded Aboriginal sites in close proximity to the study area and whether they will be impacted by the proposed works. There is potential for an increase, or decrease, in impacts to recorded Aboriginal sites.</p>
Aboriginal stakeholder consultation	<p>Comprehensive Aboriginal stakeholder consultation, carried out in accordance with the OEH 'Aboriginal cultural heritage consultation requirements for proponents 2010', must be conducted for the project.</p>
Archaeological test excavation	<p>Three areas have been identified with moderate archaeological potential and archaeological significance. Should these sites be impacted by the proposed works, archaeological test excavation, under OEH code of practice, must take place. Areas where archaeological test excavation is recommended include:</p> <ul style="list-style-type: none"> • RVRT Archaeological Complex 1 • RVRT AS 7 • RVRT PAD 1 <p>The scope of archaeological test excavation at each location, particularly RVRT Archaeological Complex 1, and RVRT PAD 1, would require</p>

Development	Discussion
	<p>clarification once the extent of proposed works in those areas is known. Test excavation at RVRT Archaeological Complex 1 would focus on undisturbed areas within the site complex that will be impacted.</p>
<p>Further archaeological survey</p>	<p>The study area boundary has been adjusted since archaeological survey was conducted for this assessment. As such, any portion of the clearance and/ or disturbance boundary outside the original investigation area must be subject to further archaeological survey. Where there are no impacts proposed within the additional areas, a heritage consultant will advise if further field survey is required.</p>
<p>Future changes to the study area boundary</p>	<p>Due to the archaeologically sensitive nature of many areas bordering the study area, further archaeological investigation must take place should any aspect of the proposal go outside the area investigated for the archaeological survey.</p>
<p>Aboriginal Heritage Management Plan</p>	<p>An Aboriginal Heritage Management Plan (AHMP) should be prepared prior to commencement of works to delineate the location of Aboriginal sites, or portions of Aboriginal sites, within the study area. Where Aboriginal sites, or portions of Aboriginal sites, are located outside the proposed extent of impacts, those areas should be clearly identified as no-harm areas in order to remove the possibility of inadvertent impact.</p> <p>Several Aboriginal sites are located in close proximity to the study area boundary. As those sites were identified using a hand-held GPS, a surveyor may be required to clearly indicate the location of the study area on the ground in relation to the recorded site location. This will assist with determining impacts and establishing no-harm areas.</p> <p>The AHMP should include an unexpected finds procedure for the proposed works, including details of required Aboriginal stakeholder consultation, identification of the nature and extent of unexpected finds, and any reporting or permits that may be required prior to works recommencing.</p> <p>In addition to identified sites within the study area, an updated AHIMS search must be conducted for the AHMP that identifies Aboriginal sites in the vicinity of the study area for the AHMP. This would identify if Aboriginal sites are located on proposed access tracks, for example.</p>
<p>Identification of existing AHIPs</p>	<p>There is potential for existing AHIPs to overlap with the study area. Further liaison with OEH should be conducted to identify where existing AHIPs overlap with the study area.</p> <p>Where existing AHIPs overlap with the study area, the proponent must liaise with the AHIP holder to ensure that all proposed works are conducted in accordance with the AHIP conditions.</p> <p>As part of this process, it must be clarified whether recorded Aboriginal site HS2A (AHIMS ID 38-4-1583) has been impacted by recent road construction works.</p>
<p>Review of this report</p>	<p>This report must be forwarded to ALALC, MLALC, and Native Title Claimants for review and comment.</p>

12.0 REFERENCES

AMBS 2012. 'Hexham Relief Roads Project: Aboriginal Heritage Impact Assessment'. Report to KMH Environmental

Cessnock City Council, 2016. 'History – our rich heritage'. Accessed online 19 October 2016
<http://www.cessnock.nsw.gov.au/community/about-our-region/history>

Environmental Resources Management Australia, 2003. 'Aboriginal Archaeology Retrieval Excavation – Hunter Employment Zone, Cessnock, NSW Test Excavation Report'. Report to Cessnock City Council

Gunson, N., 'Thelkeld, Lancelot Edward (1788-1859)'. Australia Dictionary of Biography, National Centre of Biography, Australian National University. Accessed online 19 October 2016.
<http://adb.anu.edu.au/biography/threlkeld-lancelot-edward-2734>

JCIS Consulting, 2014. 'Report on Archaeological Monitoring of Vegetation Clearing and Geotechnical Testing – Hexham Relief Roads Project'. Report to Artefact Heritage and Upper Hunter Valley Alliance

Maynard, J. 2000. Whose Traditional Land? Paper for the University of Newcastle (Callaghan). Accessed online 19 October 2016
http://www.newcastle.edu.au/data/assets/pdf_file/0009/41868/Research-document_John-Maynard_whose-land.pdf

Maynard, J., 2014. 'An Indigenous Perspective of Joseph Lycett's Art – Casting True Light and Shade on Aboriginal Life in the Newcastle Region'. National Library of Australia. Accessed online 20 October 2016.
<https://www.nla.gov.au/blogs/behind-the-scenes/2014/12/19/an-indigenous-perspective-of-joseph-lycetts-art>

Mills Archaeological and Heritage Services Pty Ltd, 2003. 'An assessment of Indigenous Heritage items within the proposed Northwest Residential Pty Ltd Development Area 290 and 302 Minmi Road, Fletcher near Newcastle'. Report to Monteath and Powys

NSW National Parks and Wildlife Service, Part of the Department of Environment and Conservation (NSW), 2005. 'Lake Macquarie State Conservation Area, Pulbah Island Nature Reserve and Mood Island Nature Reserve – Plan of Management.' Accessed online 20 October 2016.
<http://www.environment.nsw.gov.au/resources/parks/PoMLakeMacquarieSCAPulbahIslandNRMoonIslandNR.pdf>

Potter, C., 1896. Exerpts from Historical Records of New South Wales. Vol. IV. Hunter and King. 1800, 1801, 1802. Edited by F.M. Bladen. Accessed online 20 October 2016.
https://downloads.newcastle.edu.au/library/cultural%20collections/pdf/1801_14thjune.pdf

Threlkeld, L. E., 1850. 'A key to the structure of the Aboriginal language: being an analysis of the particles used as affixes, to form the various modifications of the verbs: shewing the essential powers, abstract roots, and other peculiarities of the language spoken by the Aborigines in the vicinity of Hunter River, Lake Macquarie, etc., New South Wales: together with comparisons of Polynesian and other dialects'. National Library of Australia. Accessed online 19 October 2016
<http://catalogue.nla.gov.au/Record/1027282>

Umwelt, 2011. 'Sustainable Management of Aboriginal Cultural Heritage in the Lake Macquarie Local Government Area: Lake Macquarie Aboriginal Heritage Management Strategy'. Report to Lake Macquarie City Council



artefact

Artefact Heritage

ABN 73 144 973 526
Level 4, Building B
35 Saunders Street
Pyrmont NSW 2009
Australia

+61 2 9518 8411
office@artefact.net.au
www.artefact.net.au