A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT OF THE GREATER COEGA INDUSTRIAL DEVELOPMENT ZONE (IDZ), NEAR PORT ELIZABETH, NELSON MANDELA BAY MUNICIPALITY, EASTERN CAPE PROVINCE

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SUMMARY

Note: This report follows the minimum standard guidelines required by the South African Heritage Resources Agency for compiling Archaeological Heritage Phase 1 Impact Assessment (AHIA) reports.

Proposal

The proposal was to conduct a survey of possible archaeological sites in the Coega Industrial Development Zone near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province; to establish the range and importance of the heritage sites/materials, the potential impact of the development on these and to make recommendations to minimize possible damage to these sites.

The investigation

A large number of shell middens were found on the property of the National Port Authority close to boundary with the Coega IDZ and the Nelson Mandela Municipality. Occasional Earlier, Middle and Later Stone Age stone tools were found throughout the Coega IDZ where river gravels were exposed. Most of the property is covered by dense long and short grass and impenetrable thicket vegetation which made it difficult to find sites/materials.

Cultural sensitivity

A large part of the Coega IDZ investigated is within 5 km from the coast (maximum distance inland that coastal archaeological remains will be found) and such material may be found during developments. Although the stone tools appear to be of low cultural sensitivity, other archaeological sites/materials may be exposed when the vegetation and top soil are removed (for example human remains).

Recommendations

1. The South African Heritage Resource Agency (SAHRA) must visit the Coega IDZ and meet with the Coega Development Corporation to gain first hand information on the status of the developments - past, present and future. Follow-up meetings should take place annually.

2. The original approach of project-specific AIA's for each development must be retained, so that an accurate record is kept of all archaeological sites.

3. All developments as specified by the National Heritage Resources Act (NHRA), must be registered to SAHRA in advance as required by NHRA.

4. All construction work, including drilling operations must be monitored by an archaeologist.

5. Zones 1, 7 and 10 are next or close to the coast and are regarded as sensitive areas and all activities must be monitored. In future the vegetation must be cleared by hand and not by earth removing equipment.

6. A person must be trained as a site monitor to report to the foreman when archaeological sites are found.

7. If any concentrations of archaeological material are uncovered during development it should be reported immediately to the nearest archaeologist, museum and/or the South African Heritage Resources Agency.

8. Construction managers/foremen should be informed, before construction starts, of the possible types of heritage sites which may be encountered during construction.

9. An AIA must be conducted for the proposed storm water outlet construction and the shell midden complex adjacent to the development. The shell middens are on the property of the National Port Authority.

10. It is suggested, from a logistical perspective, that Coega Development Corporation should employ an archaeologist full-time to manage the archaeological surveys and heritage of the Coega IDZ.

PROJECT INFORMATION

Status

The AIA is part of a HIA.

The type of project (copied from the Coega Development Corporation's Heritage Impact Assessment tender document).

> The Coega Industrial Development Zone (IDZ) covers an area of approximately 12 000ha. Two Environmental Impact Assessments (EIAs) were conducted for the change in land use of the IDZ. A Heritage Impact Assessment (HIA) did not form part of the EIAs. However, HIAs have been done as part of selected site-specific EIAs done by investors, for their proposed listed activities to be conducted within the IDZ. The Coega Development Corporation (CDC) compiled an Open Space Management Plan (OSMP) in 2003 and all known heritage resources were identified and form part of the CDC's OSMP. These heritage resources have also been mapped using GIS. An abundance of information on the heritage resources in the Coega IDZ is therefore available.
>
> In order to comply with the National Heritage Resources Act, 1999 (No. 25 of 1999) and to produce a Heritage Management Plan for the Coega IDZ, the CDC invites interested entities to respond to this Request for Proposal (RFP) to conduct a Heritage Impact Assessment for the Coega IDZ.

Coega Development Corporation (CDC) requested a comprehensive Heritage Impact Assessment of the Coega IDZ that will meet the requirements of the National Heritage

Resources Act of 1999. The Archaeological Impact Assessment is part of this project. The aim of the CDC is to provide a comprehensive HIA for the entire Coega IDZ for future investors.

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Terms of reference

Conduct a survey of possible archaeological heritage sites in the Coega Industrial Development Zone near Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province;

- to establish the range and importance of the heritage sites
- the potential impact of the development
- and to make recommendations to minimize possible damage to these sites.

BRIEF ARCHAEOLOGICAL BACKGROUND OF THE COEGA REGION

Brief non-specialist summary from previous investigations

The oldest evidence for prehistoric people living in the wider region comes from the river gravels which line the Coega River valley/estuary. Large stone tools, called handaxes and cleavers, dating from the Earlier Stone Age, approximately a 1,5 million years to 250 000 years ago, were found mixed with river gravels. There were no other cultural material or food remains, i.e., bones of animals preserved. These stone tools were in secondary context (disturbed or transported from their original place of manufacture) and provided limited information.

The oldest evidence for prehistoric groups living along the Coega River coast is a few weathered Middle Stone Age stone tools. These stone tools, points and blades, were manufactured between 30 000 and 250 000 years ago (late Pleistocene). No other cultural or food remains (shellfish, marine fauna or terrestrial fauna) were preserved. Fossil bone (bone hardened by ground water and minerals) was found in limestone or calcrete deposits some 5 kilometres inland from the Coega estuary associated with Middle Stone Age stone tools.

The majority of the archaeological remains found during the surveys were accumulations or heaps of shell (shell middens) and stone tools. These remains date from the past 10 000 years (Holocene). These accumulations of shell, called shell middens, are often concentrated

opposite or near rock outcrops where an abundant and a wide range of shellfish species are to be found in the intertidal zone. Shell middens are usually, but not as a rule, less abundant opposite sandy beaches, mainly because there is only one shellfish species available, namely *Donax serra* (white sand mussel) which burrows under the sand. Shell middens are not always visible because they are covered by dunes and vegetation and are often encountered during building operations in coastal towns and holiday resorts. Shell middens contain a wealth of information, not only about past subsistence and cultural patterns, but also of past environments. Archaeological evidence indicates that people of different cultural groups exploited the shoreline for food for many thousands of years. The oldest evidence in the world of marine exploitation by early people comes from a cave some 40 km west of Cape St Francis in the eastern Cape and dates to 120 000 years ago.

Shell middens represent the campsites/living sites of indigenous people who exploited the shoreline for food. Most people refer to them simply as ‘strandloper’ remains. However, ‘strandlopers’ were not a distinct ethnic/cultural group, and the term rather describes a way of life or socio-economic activities. Shell middens are simply prehistoric ‘rubbish’ dumps of food waste, mainly the shells of the different species collected, deposited by people living along the coast. Apart from the shells, remains of marine fish, mammals and birds, terrestrial fauna and plant foods are also present in the middens. Mixed with the food waste are also cultural materials such as stone tools, pottery, bone tools and shell ornaments. Human burials are often found in shell middens.

From the records of early travellers and settlers in southern Africa it is evident that the indigenous population in the Eastern Cape consisted of at least three distinct cultural groups exploiting marine resources at the time of contact. Popularly these groups are known as Bushman (hunter-gatherers), Hottentots (Khoekoen pastoralists) and Bantu-speaking people (agropastoralists/mixed farmers). Hunter-gatherers lived in most of southern Africa for the past 20 000 years in small bands within roughly defined territories. Their movements within these territories depended on the seasonal availability of food resources at different times and places; this also included the coastal resources. Khoekoen pastoralists settled in the Eastern Cape coastal region some 1 800 years ago (AD 100), they possessed domestic stock (sheep, goats and cattle) and produced ceramic vessels (clay pots). Although little is known about the early black mixed farmers in the Eastern Cape, we know that they were already living in the Great Kei River valley and along the East London coast 1250 years ago (AD 700). Thus, from the historical and prehistoric observations it is clear that the term ‘strandlopers’ refers not to a specific ethnic group or culture, but to several groups.

The oldest shell middens in the area contain microlithic stone tools (small scrapers, bladelets, borers and chisels). Usually these stone tools were manufactured of fine grained raw materials such as chalcedony and silcrete and are also found in caves and shelters further inland in the adjacent Cape mountains. These stone tools were made by hunter-gatherer people from a time period called the Wilton Period, and date between 8 000 years old and historical times. Middens with silcrete stone tools were most probably created by inland groups who visited the coast from time to time or on a regular seasonal basis and may date older than 5 000 years. This also explains the presence of silcrete tools along the coast because there are no silcrete outcrops along the coast and the raw material was brought to the coast by inland visitors.

The majority of the middens along the Coega River coast were probably the remains of groups who were permanent residents of the coast and manufactured stone tools of locally available quartzite and shale beach cobbles. These middens are estimated to date within the past 4 000 years. The few ceramic fragments (clay pot sherds) indicate that possibly Khoekoen pastoralists were also living or passed through the area. Unfortunately no evidence of their campsites or remains of domesticated animals such as sheep and cattle could be positively identified. The few pot sherds date within the past 1 800 years.

All three of these groups exploited the sandy beaches as well as the dune fields and the adjacent vegetated habitats. Unfortunately, little food remains (marine fish and birds and terrestrial fauna), apart from shellfish remains were recovered from the shell middens. However, food remains recovered from the middens provide us with some insights of the prehistoric groups' subsistence patterns. They collected mainly *Donax serra* (white sand mussel) from the sandy beaches, but also collected the little *Perna perna* (brown mussel) that was available from the few rocks present along this part of the coast.

Both the fish species identified *Pomadasys commersoni* (spotted grunter) and cf. *Rhabdosargus holubi* (Cape stumpnose), are commonly found in estuaries, and it is assumed that they captured the fish in the shallow waters of the Coega River estuary. The presence of *Nassarius kraussiana* shells (also called tick shells and often made into beads), which only occurs in estuaries, support this assumption.

The remains of sub-adult marine birds, *Phalacrocorax carbo lucidus* (white breasted cormorant) and *Sphenisus demersus* (jackass penguin) were also found in the shell middens. These birds were either easy to catch or were collected as beach wash-ups. It is also possible that prehistoric groups timed their stay at the coast to exploit this food resource, because marine birds are most vulnerable at the sub-adult stage.

Hunting or trapping of small bovids such as cf. *Raphicerus* sp. (grysbok and steenbok) probably took place in the adjacent dunes and scrubland. The remains of tortoise (*Homopus areolatus* - padlopertjie) indicate that this was also an important food resource, not only for its flesh, but also for it carapace which can be used as a container. The many ostrich eggshell fragments recovered from the middens also underline the importance of ostrich eggs in the subsistence of prehistoric groups. The egg provided food and the shells were used as water containers and the fragments of broken eggs were made into beads.

The little food waste found, such as terrestrial mammal fauna, fish and other marine fauna, and the relatively small size of the middens, may suggest relatively short stays of a few days or a week or two. During this period the staple food was mainly shellfish. Trips to the coast were probably made on a seasonal basis to supplement the mineral content in their diet.

Apart from the thousands of stone tools which occurred in the area, no other cultural remains were found. These stone tools date within the last 5 000 years, but were in secondary context. Originally the tools must have been deposited on dunes or soil horizons much higher than their present position, and the hard calcrete floor acted as catchments for them.

Despite the relatively little cultural and food remains recovered from the shell middens, the surveys provided important data and contributed to our understanding of prehistoric settlement and subsistence strategies in an area about which we previously knew little.

CULTURAL SENSITIVITY OF THE COEGA REGION

Brief historical archaeological background

A Heritage Impact Assessment of the area will be compiled and therefore these are only supplementary notes. Relatively little information is available on the history of the Coega area and there are only a few brief references to past inhabitants and events to provide information on possible historical archaeological sites and/or material (historical archaeology = sites/material which originated from contact/interaction between indigenous people and European settlers).

The Coega (or Koega) River was first mentioned by historical travellers in 1752 (Theal 1896). The name Coega is of Khoekhoen origin and means literally ‘seacow’ or hippopotamus (Nienaber & Raper 1977). In November 1776, Anders Sparrman (1785) found a community of Cochoqua Khoekhoen (remnants of the Cochoqua who had fled the Cape after their defeat in the second Khoekhoen-Dutch War one hundred years previously), living on the Coega River. They were caring for the stock of a Dutch burger. Nearby was a group of Gonaqua Khoekhoen, led by a captain named Tadi, who were also tending to the stock of a Dutch farmer. The nearby Coega Kop is shown on maps dating back to 1834 (Port Elizabeth Museum) and is reported to have been used as a navigation beacon by sailing ships wishing to enter Port Elizabeth harbour in the past. The ‘kop’ which has been quarried since the 1920s by SA Railways and Harbours for the development of the Port Elizabeth Harbour (Skead 1993) is likely to disappear soon with the continuation of intensive quarrying.

The salt pan behind Coega Kop (not the present locality of the salt works at the river estuary) was being mined for its salt as early as 1820. However, this salt pan is likely to have been destroyed with developments in the area. A map of 1851 which indicated that the original road between Port Elizabeth and Grahamstown closely followed the present National road across the Coega River also revealed the presence of a ‘Junction Post’ on the crossing. While Coetzee’s (1995) definitive book on the forts of the Eastern Cape failed to indicate the presence of this military post, it is likely to represent one of Cradock/Somerset’s temporary earthen fortifications established between 1812 and 1819 to protect the eastern frontier. This post, in all likelihood, no longer exists.

Two well eroded fragments of Willow pattern porcelain fragments were recovered from near the Coega River Mouth (before the harbour was constructed), which may have washed-up from a nearby nineteenth century shipwreck. Bennie (2002) has reported on several ships that floundered between the mouth of the Coega and Zwartkops River, between 1817 and 1880. There is also evidence of wreck material just off the Island of Jahleel.

Brief archaeological background

Early Stone Age (approximately 250 000 - 1,5 million years old) stone tools are found throughout the area. Large handaxes were reported from Coega Kop and were also collected from the banks and gravels of the Coega River and between the N2 national road and the salt works (Albany Museum collections). One of South Africa’s most important Earlier Stone Age finds and excavations (Deacon 1970) was conducted a few kilometres west of the surveyed area, at Amanzi Springs. In a series of spring deposits a large number of stone tools were found *in situ* to a depth of 3-4 metres. Remarkably wood and seed material preserved in the spring deposits, possibly dating to between 250 000 to 800 000 years old, were found.

Middle Stone Age (250 000 - 30 000 years ago) and Later Stone Age (20 000 years ago to historical times) stone tools are also found in the gravels and along the banks of the Coega River. These stone artefacts, like the Earlier Stone Age handaxes are in secondary context with no other associated archaeological material.

Occurrences of fossil bone remains and Middle Stone Age stone tools were also reported south of Coega Kop (Gess 1969). During excavations the remains were found in the surface limestone, but the bulk of the bone remains were found some 1-1,5 metres below the surface. The excavations exposed a large number and variety of bones, teeth and horn corns. The bone remains included warthog, leopard, hyena, rhinoceros and ten different antelope species. A radiocarbon date of older than 37 000 years was obtained for the site.

The most common archaeological sites found in the area are shell middens. They are relatively large piles of marine shell and represent the campsites of San hunter-gatherers (dating from as old as 6 000 years ago), Khoekhoen pastoralists and KhoeSan (dating from the past 1 800 in the region) peoples who lived along the immediate coast and collected marine foods on a daily basis. The Khoekhoen people were the first food producers in South Africa and introduced domesticated animals (sheep, goat and cattle) and ceramic vessels to southern Africa as early as 2 000 years ago.

In general these shell middens date from the past 6 000 years. They are found mainly opposite rocky coasts, but also occur along sandy beaches if there was a large enough source of white mussel. Shell middens are usually within 300m of the high water mark, but can be found up to 5 km inland (Binneman 2001, 2005). Mixed with the shell and other marine food waste, are other terrestrial food remains, cultural material and often human remains are found buried in the middens. Also associated with middens are large stone floors which were probably used as cooking platforms.

Shell middens and the remains of at least 12 clay pots were reported by Rudner (1968) west of the Coega River Mouth. A large number of shell middens were also situated east of Coega River Mouth. Several of the middens were sampled and excavated just before the harbour was constructed. Many middens, ceramic pot sherds (from Later Stone Age Khoekoen pastoralist origin - last 2 000 years) and other archaeological material, are situated between the Coega and Sunday's River Mouths. These remains date mainly of Holocene Later Stone Age (last 10 000 years). Human remains have also been found in the dunes along the coast.

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DESCRIPTION OF THE PROPERTY

Area surveyed

Location data

The Coega Industrial Development Zone (IDZ) is located some 25 kilometres north-east of Port Elizabeth, Nelson Mandela Bay Municipality, Eastern Cape Province (Maps 1-3).

Maps

1:50 000 3325 DC & DD 3425 BA Port Elizabeth and 3325 AD Addo

ARCHAEOLOGICAL INVESTIGATION

Previous archaeological investigations in the area

The first archaeological investigation of the beach and adjacent dune fringe east of the now abandoned abalone farm and the present day Coega Harbour, was conducted during 1994 (Binneman 1994). The majority of the archaeological material found during this survey occur within 300 m of the beach scattered between the dune bays and consist of occurrences of Later Stone Age stone tools (mainly manufactured from hornfels and silcrete), pottery and occasional Middle Stone Age stone tools. The Later Stone Age sites are of hunter-gatherer origin and were most probably created by inland groups who visited the coast from time to time or on a seasonal basis and date within the past 5 000 years.

A few years later Binneman and Webley (1996, 1997a, 1977b) compiled baseline reports on the cultural sensitivity of the Coega Industrial Development Zone for the proposed Eastern Cape Zinc and Phosphoric Acid Project and conducted a survey of the Coega River estuary. These surveys were followed-up during 1999 when a full Phase 2 investigation was conducted along the eastern side of the Coega River Mouth (Binneman 1999). This investigation included the detailed mapping, excavations and collection of visible archaeological features which would be destroyed during the construction of the harbour development. The most important features were a number of *in situ* and deflated shell middens. Stone tools, mainly of Holocene Later Stone Age (last 10 000 years) origin were scattered throughout the area. Surprisingly, few pot sherds (from Later Stone Age Khoekoen pastoralist origin - last 2 000 years) were found. The oldest evidence for human occupation was a few isolated well-weathered Middle Stone Age stone tools. Although concentrations of stone tools were observed, no 'patterns' or specific activity areas could be identified (for a detailed report see Binneman 1999).

Several years past before more investigations in the area were conducted, notably again along the eastern coast and shifting dune system (Kaplan 2007; Webley 2007; Binneman 2008, 2010a & b). Kaplan found more weathered Middle Stone Age stone tools in a dune area next to the harbour dump and Webley recorded a number of new occurrences during a survey for a proposed pipeline. Binneman (2008) also found a few new sites, but could not relocate sites found during 1994. These were probably buried by dunes. All the sites located in the dunes date from the past 8 000 and human remains were also found near the abalone farm.
In recent years a few surveys were conducted in the land side zones. Van Schalkwyk and Wahl (2006) surveyed the area for a power line construction, Binneman (2006) the peaking power plant in Zone 13, Webley (2006) the proposed Afro-Asia Steel Recycling and Processing Facility in Zone 6 and a property in Zone 3, and Kaplan (2008a & b) for the proposed Exxaro Manganese Smelter and the Kalagadi Manganese smelter also in Zone 6. In all these cases mainly occasional Earlier, Middle and some Later Stone Age tools were found.

CURRENT ARCHAEOLOGICAL INVESTIGATION

Methodology

The size of the property and the dense thicket vegetation precluded a detailed survey. The Coega IDZ is divided into 14 zones which cover approximately 12 000 hectares. Only 13 of the 14 zones (some 9 200 hectares) were investigated because Zone 8 is owned by the National Port Authority and was excluded from the survey before the study started. The investigation was conducted by two people on foot and spots checks and surveys from a vehicle. GPS readings were taken with a Garmin Plus II and all important features were digitally recorded.

This large property has been disturbed in the past by small scale farming activities, brick making, clay mining and more recently by the large scale development of the Coega IDZ infrastructure. Most of the property is covered by impenetrable thicket vegetation, and short and long dense grass. The dense vegetation made it almost impossible to find archaeological sites/material. Ironically areas that could be investigated were the wide cleared strips adjacent to roads and drainage channels, buildings and other features. Unfortunately these strips were further disturbed by the construction of water pipe lines and drainage channels. All archaeological sites would have been totally destroyed in these areas.

Archaeological sites/materials were found throughout the Coega IDZ. Shell middens, Later and Middle Stone Age stone tools were found along the coast and adjacent sand dunes. Occasional Earlier, Middle and Later Stone Age stone tools were found in all of the inland zones. The stone tools are situated in the thin layer of top soil which covers the underlying hard calcrete deposits, or on the surface where the calcrete is exposed. The Middle Stone Age stone tools, with typical facetted striking platforms, were found mainly where pebble/cobble gravels were exposed. The tools were predominantly small ‘informal’ flakes and chunks with few cores, points and blades. Although many flakes displayed utilization damage, few were ‘formally’ retouched. No spatial patterning or activity areas such as ‘manufacturing’ sites were located, although such sites may exist but were not be visible. In general these stone tools were in secondary context and not associated with any other remains.

No attempt was made to record all these incidences because they are distributed throughout the landscape. Where concentrations of tools were found during the spot surveys, these were recorded as representative samples of that specific area.

INVESTIGATION OF THE DIFFERENT ZONES

ZONE 1

Zone 1 is situated south-west of the Coega Business Centre between the N2 national road and the National Port Authority property (Maps 1-4). Large scale development/construction has taken place in this zone. The zone has been divided in large squares by a well-established road and drainage infrastructure (Figs 1-6). Development takes place within these squares. The outlet for the drainage system for Zones 1 and 2 has been proposed to be constructed along the southern boundary of the Coega IDZ, National Ports Authority and the Nelson Mandela Municipality properties (Appendix 1). Most squares have approximate 20 metre wide strips cleared of vegetation adjacent to the roads. In general the vegetation within the squares and elsewhere is impenetrable and made it difficult to find archaeological sites/materials. The only areas that could be investigated were the strips and other 'cleared' areas. Unfortunately these strips were further disturbed by the construction of water pipe lines and drainage channels. If there were any archaeological sites these were totally destroyed (Figs 7-10).

However, in spite of the large scale clearing and levelling activities, occasional quartzite Middle Stone Age stone tools (dating between 30 000 and ca 200 000 years old) were found, especially where pebble/cobble gravels were exposed (Figs 11-12). The stone tools, with typical facetted striking platforms, are situated in the thin layer of top soil which covers the underlying hard calcrete deposits, or occasionally on the calcrete surface where it is exposed. The tools were mainly small 'informal' flakes and chunks with few cores, points and blades. Many flakes displayed utilization damage, but few were 'formally' retouched. No spatial patterning or activity areas such as 'manufacturing or camping' sites were located, although such sites may exist but were not visible. All stone tools were in secondary context and not associated with any other remains such as fossil bone. Fossil mammal bone remains were located in the nearby Markman Industrial Area (Figs 13-18).

Although no Earlier Stone Age stone tools (which may date between 250 000 to 1,5 million years old) were found in Zone 1, one would expect to be found occasional tools mixed with the red-brown pebble/cobble gravels. These may include large pear-shaped handaxes, cleavers, flaked cobbles and flakes. The tools are easily identified due to their weathered, red/brown colour look, opposed to the 'fresh' white, grey and yellowish appearance of the MSA stone tools.

Zone 1 is located close to the coast and falls within the maximum distance coastal archaeological sites, such as shell middens are expected to be found from the coast. Although no marine shell remains were found during the spot check surveys in the cleared and disturbed areas, these may be either destroyed by the large scale developments or covered by the dense thicket vegetation. Thirteen shell middens were excavated and sampled during the Phase 2 archaeological investigation at the eastern side of Coega River Mouth. There are also many shell middens and features (more than 20) close to the area where the proposed drainage outlet will be constructed (Appendix 1).

Figs 1-6. Different views of the well-established road system, facilities and large buildings, large size of the drainage systems and the scale of damage caused to the landscape in Zone 1. Note: the channel top right runs close to the coast.

Figs 7-10. Different views of the cleared areas for the construction of buildings and other facilities. Note the dense vegetation and the wide strips cleared from vegetation.

Figs 11-12. An example of the Middle Stone Age stone tools found in the pebble/cobble gravel exposed by clearing and building activities near the Coega Business Centre.

ZONE 2

Zone 2 is situated between the N2 national road and Markman Industrial Area (south-west of the Coega Business Centre) and is similar to Zone 1 in terms of the layout, well-established road and drainage infrastructure, geology and vegetation (Maps 1-4) (Figs 13-20). An AIA was conducted for two petrol filling stations on both sides of the N2 national road (Appendix 2). The clearing patterns are also similar (wide strips cleared next to roads), but there are no large buildings constructed yet. Occasional quartzite Middle Stone Age stone tools similar to those in Zone 1 were found where pebble/cobble gravels were exposed, but were not recorded.

Figs 13-16. Views of the well-established road and drainage system in Zone 2.

Figs 16-20. Views of the well-established road system, facilities, clearing patterns and impenetrable vegetation (top right) in Zone 2.

ZONE 3

Zone 3 is situated between Markman Industrial Area (north-west of the Coega Business Centre) and Zone 4/R102 main road to Motherwell (Maps 1, 2, 3 & 5). This zone is also similar to the other zone above and has a well-developed infrastructure and several large building has already been built while others are under construction (Figs 21-26). Occasional quartzite Middle Stone Age stone tools similar to those in other zones were found where pebble/cobble gravels were exposed, but were not recorded.

Figs 21-22. Views of the well-established road system, facilities and clearing patterns in Zone 3.

Figs 23-26. Views of the well-established road system, facilities, clearing patterns and dense vegetation (top right) in Zone 3.

ZONE 4

Zone 4 is situated north-west of Zone 3/R102 main road and south of the Coega Kop quarry (Maps 1, 2, 3, & 5). Apart from some development in the south-west corner next to the R102

main road, no other development has been taken place in the rest of the Zone. The Zone has been disturbed in the past by many small quarries, especially along the R102 main road and recently by the construction of a power sub station, power line and pylons (Figs 27-28). The vegetation is dense and impenetrable in most areas, which made it difficult to find archaeological site/materials. However, isolated red brown quartzite Earlier Stone Age flakes were found in a large area along the western boundary of Zone 4 which had been cleared of vegetation (GPS reading: 33.47.011S; 25.36.871E). Calcrete has been mined subsequently, apparently without an Archaeological Impact assessment (Figs 30-32). Occasional quartzite Middle Stone Age stone tools similar to those in other zones were found, but were not recorded.

Figs 27-28. Views of the power sub station and pylon construction in Zone 4. Note the large area that has been cleared of vegetation.

Figs 29-32. Views of the impenetrable thicket vegetation (top row photographs) and the large area cleared for calcrete mining (bottom row photographs) in Zone 4.

ZONE 5

Appendix 3

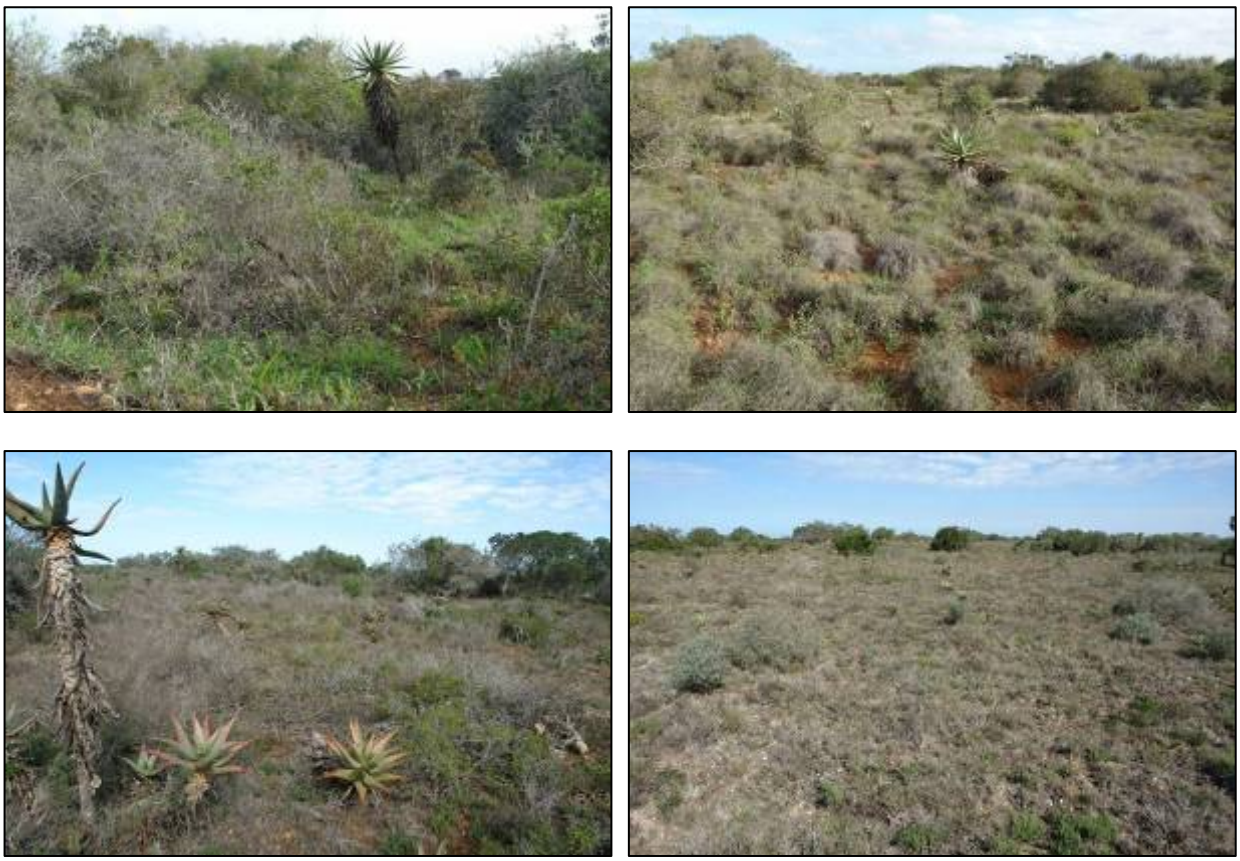
ZONE 6

Zone 6 is situated between the N2 national road and Zone 11 along the north-eastern boundary of the Coega IDZ (Map 1, 2, 3 & 6). The R334 main road runs through the zone and apart from road building at the western side of this road/zone and pipeline construction next to the N2, there is no development in this zone yet (Figs 33-34). Three HIA's were conducted in this zone by Webley (2007) and Kaplan (2008a, 2008b). Webley's survey for the Afro-Asia Steel Recycling and Processing Facility covered some 6 ha in extent and was located next to the R102 road to Motherwell. Kaplan conducted HIA's for the Exxaro Alloystream Manganese Plant (15 ha) and the Kalagadi Manganese Smelter (160 ha). The latter will now be accommodated in Zone 5 (Appendix 3).

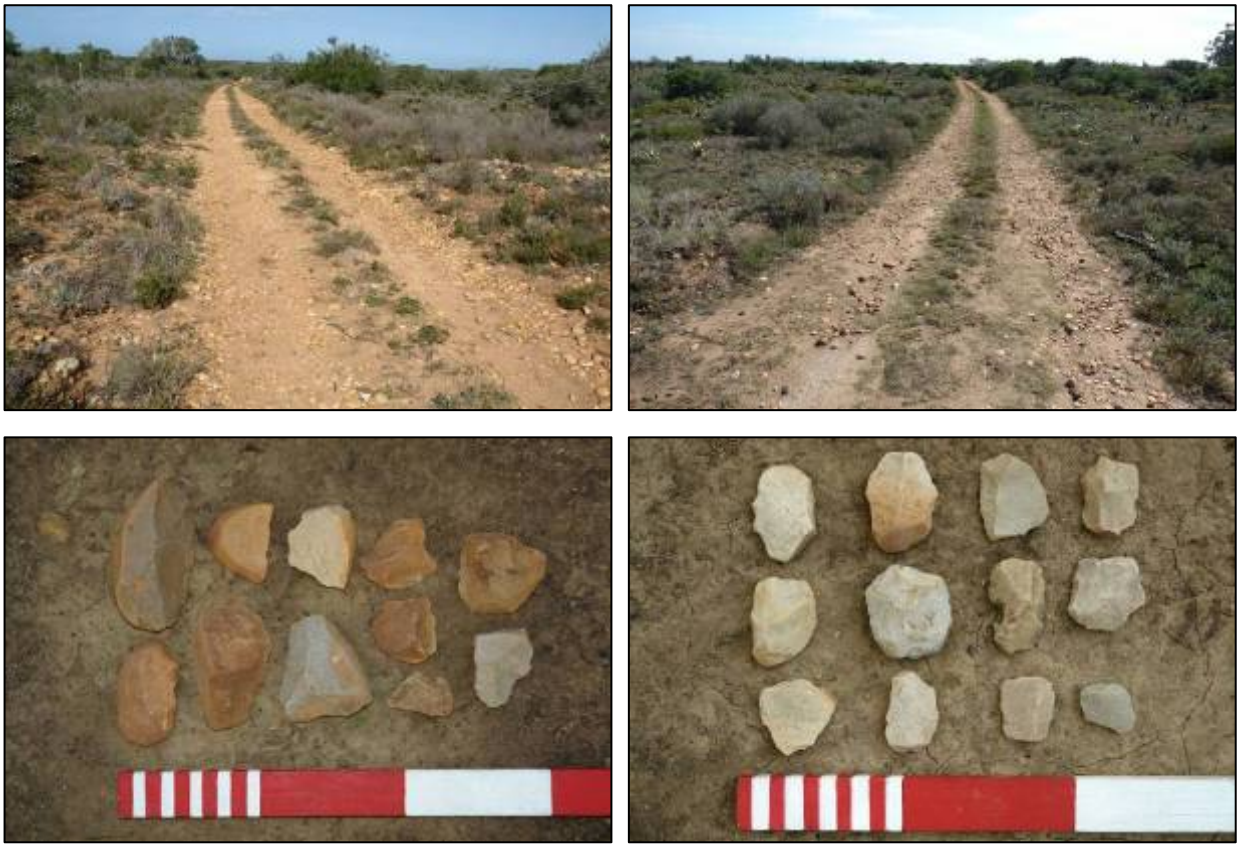
Most of the Zone was used for farming activities (farm houses and buildings have been demolished), probably mainly grazing and is relatively undisturbed. Most of the area is covered by dense thicket vegetation. The geology of the area is dominated by a thick layer of calcrete overlying by thin layer of soil. In places the sub-surface calcrete is visible on the surface, and often covered in a thin layer of quartzite pebbles/cobbles gravel (Figs 35-38).

The archaeological investigations conducted in Zone 6 by Webley, Kaplan and the present one reached similar observations and conclusions. Stone tools were found throughout the zone, but the density and type may vary from place to place. For example, where pebble/cobble gravels are exposed, the number of stone tools will be 'higher' than areas where calcrete floors are exposed. The majority of the stone tools were mainly of Earlier and Middle Stone Age and occasional Later Stone Age origins (Figs 39-42). The stone tools which comprised of quartzite flakes, chunks, flaked pebble/cobble and cores were randomly distributed across the landscape and are in secondary context. There were no 'concentrations' of tools observed which suggested any spatial patterning or activity areas, although these may be present or covered by soil and vegetation.

Figs 33-34. Road building in the western part and pipe line construction along the N2 national road in Zone 6.



Figs 35-38. Different views of the vegetation in Zone 6 which made it difficult to find archaeological sites/materials.



Figs 39-42. Earlier and Middle Stone Age stone tools found in the cobble/pebble gravels exposed by tracks in Zone 6.

ZONE 7

Zone 7 is situated between the N2 national road and Zone 10 which is adjacent to the coast (north-west of the Coega Business Centre) (Maps 1, 2, 3 & 8). Large scale development is taking place mainly towards the western side of the zone. These include the building of bridges, roads, a power sub station, power lines, a massive quarry and construction of buildings (Figs 43-44). A new road is also being constructed east to west, parallel to the N2 on the boundary between Zones 7 and 10.

The zone is covered by dense grass, bush and alien vegetation which made it difficult to find archaeological sites/material (Figs 45-46). Calcrete is the dominant geological formation in the area and is covered by a thin layer of grey dune sand. Bush clearing for the construction of the east/west road exposed the grey dune sand and also thin scatters of archaeological material towards the eastern side of the zone.

A thin spread of marine shell, mainly fragmented *Donax serra* (white mussel) was noted over a fairly large area. Fragments of bone, a tooth, stone tools and pottery were also associated with the shell spread. GPS readings; site 1: 33.45.774S; 25.42.829E and site 2: 33.45.772S; 25.42.833E). The presence of Khoi pottery relatively date the material to younger than ca 1 800 years.

Where the dune sand was completely removed by bulldozers, Middle Stone Age stone tools were exposed on top of the calcrete towards the eastern side of the road. There was no other material associated with the tools (GPS reading: 33.46.022S; 25.43.470E). A small fragment of Khoi pottery found on top of a 'wall' of bulldozed top soil and bushes indicate that at least one archaeological site was destroyed in this area (GPS reading: 33.46.066S; 25.42.366E) (Figs 47-54). It is unknown how many archaeological sites were destroyed when this area was bulldozed to make way for a road.

Although it is not part of the archaeological investigation, the presence of historical material is reported here which have been exposed by the construction of the road. Only two pieces of ceramics were found, but these may have been part of a larger accumulation.

Figs 43-44. Views of the large scale damage caused recently to the landscape by quarrying, road and power sub station constructing activities in Zone 7.

Figs 45-46. Different views of the dense vegetation in Zone 7.

Figs 47-52. Khoi pottery, stone tools, animal tooth and bone fragments (top left), Middle Stone Age stone tools (middle left) and historical ceramics (bottom left) exposed/disturbed/destroyed by road making and other activities (right top, middle and bottom)

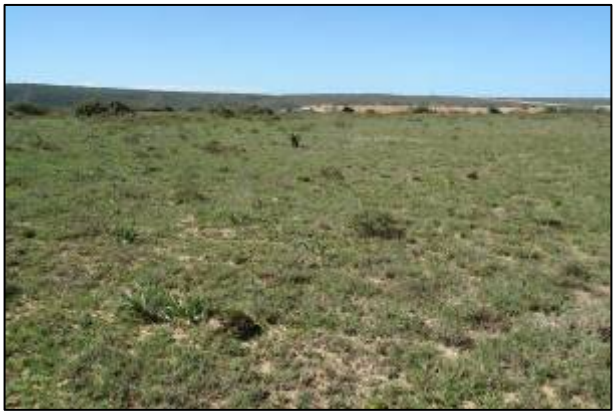
Figs 47-54. Khoi pottery on top of a 'wall' of sediment created by the construction of a road in Zone 7.

ZONE 9

Zone 9 is situated almost in the centre of the IDZ north of the N2 national road (Maps 1, 2, 3 & 7). The Coega River valley comprises most of the zone. For many years farming, brick making and salt producing activities disturbed and changed the vlei/wetlands along the river, and more recently dumping of building and other rubble, the construction of a massive railway yard, roads and power lines restructured the landscape. Several old farm houses and other buildings have been demolished throughout the zone. Notwithstanding there are still large areas covered with impenetrable thicket vegetation and dense grass, especially areas adjacent to the river and eastern plateaux. The western area of the zone (west of the railway line has been disturbed in the past by farming activities (Figs 55-68).

The disturbances and dense vegetation made it difficult to locate archaeological sites/materials, but occasional Middle Stone Age stone tools were found where the pebble/cobble gravels have been exposed. Usually areas close and adjacent to rivers and wetlands are very sensitive areas for archaeological sites and materials. These are the obvious area where pre-colonial populations would have lived for short periods of time to utilise resources along the river banks such as freshwater mussel, hunting and trapping of a wide variety of animals, and grazing and water for cattle, sheep and goats. These activities disturbed and demolished any/all archaeological sits and/or materials that may have been located in Zone 9.

Figs 55-56. Views of the Coega River valley and Zone 9. Note the impenetrable thicket vegetation.




Figs 57-58. Views of the dense short grass adjacent to the Coega River and old fields towards the western area (west of the railway line) of Zone 9.






Figs 59-64. Views of the developments in Zone 9 which include brick making, the construction of roads, drainage channels, railway lines, dumping and mining activities.

Figs 65-68. Middle Stone Age stone tools were found where the pebble/cobble gravels were disturbed or exposed.

ZONE 10

Zone 10 is situated along the coast and different areas has been investigated several times by the author (1994, 2008, 2009), Webley (2007) and Kaplan (2007) (Maps 1, 2, 3 & 8). Most of the coastal foreland is covered by impenetrable alien *Acacia*, and made it difficult to find archaeological sites/material (Figs 69-70). A few sites were found in the shifting dunes, but obviously more sites are covered by sand and vegetation. The area is composed of calcrete bedrock covered by a thin layer of dark soil, which do not allow for any deep archaeological deposits. The hinterland behind the coastal dunes is also covered with dense dune and alien vegetation. A few sites from previous surveys could not be found.

Figs 69-70. Views of the dense alien vegetation which covers the coastal foreland to high water level.

The western beach and adjacent dune fringe

The beach and adjacent dune fringe were first investigated during 1994 (Figs 71-72). A GPS was not available and the locations of sites were recorded on air photographs. Occasional weathered/sand polished Middle Stone Age and Later Stone Age stone tools were found along the immediate beach area where the calcrete floor was exposed or covered thinly by dune sand (Binneman 1994). The stone tools were mainly manufactured of locally available quartzite cobbles, but the occasional black hornfels stone tool was also noticed. There was no other archaeological material associated with the tools which occurred randomly/unevenly along the coast. These stone tools are of low cultural significance. Webley (2007) also recorded some of these occurrences during a survey for a proposed pipeline (Map 10). Some of the sites observed during 1994 could not be relocated during the recent survey and are most probably buried. A similar pattern of stone tools distribution was also described by Kaplan (2007) along the western boundary of the property, but it would appear that the concentrations of Middle Stone Age stone tools were more numerous there than further east (Binneman 1994).

The shifting dune area

Archaeological sites/materials are usually found on exposed calcrete floors or black soils ('old vlei deposits') in the bays between the slow eastward moving sand dunes. Not many sites were known from the high shifting sand dune area. During 2004 a part of a human skull was donated to the Albany Museum by one of the managers of the nearby abalone farm. Unfortunately the exact location could not be established during a visit to the dunes (Map 10). A number of sites were recorded during Webley's survey which followed a narrow straight line through the dunes. A few more sites were added to the list during the recent survey.

Figs 71-72. Views of the western beach and adjacent shifting dune area.

Sites recorded in the shifting dune area

1. Three small midden scatters (LW site 6 area) - **33.46.632S; 25.42.732E**

- Midden scatters.
- Low sensitivity, a general IVB/C site and should be recorded before destruction.

A large part of the deflation bay consisted of a thick black sandy deposit (old vlei/waterlogged area). There were three small concentrations of *Perna perna*, each approximately one square metre in size, close together and may have been part of one large shell midden in the past. Apart from a few large tortoise bones, no other food waste or cultural materials were found (Figs 73-74).


Figs 73-74. Shell midden scatters in the foreground next to an old vlei/waterlogged soil area.

2. Scatter of stone tools and pottery (LW site 6 area) - **33.46.659S; 25.42.767E**

- Scatter of stone tools and pottery.
- Low sensitivity, a general protected C site and has been sufficiently recorded.

This site was in the same dune deflation bay, some 50 metres south of site 1. A few quartzite stone tools and pottery fragments were scattered randomly (Figs 75-76).


Figs 75-76. General view of site 2 area. Note the 'dark soil'.

3. Scatter of pottery fragments - **33.46.629S; 25.42.855E**

- Scatter of pottery.
- Low sensitivity, a general protected C site, but pottery should be collected before destruction.

A few pottery fragments which included two large decorated rim pieces and a large fragment of ostrich eggshell were scattered among the grass of a large deflation bay. The horizontal line pattern on the rim fragments is typical of coastal KhoiSan pottery. The pot shards date younger than 1 800 years old (Figs 77-80). No other material was found with the pot shards but a few *Donax serra* shell fragments were found scattered randomly nearby.

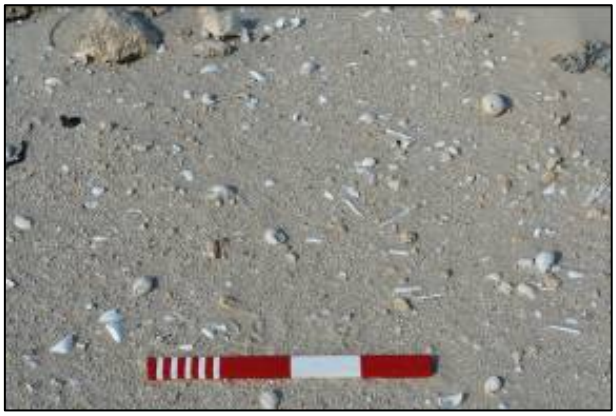

Figs 77-78. General view of site 3 area and the scatter of pottery.


Figs 79-80. Ostrich eggshell and decorated rim fragments from site 3.

4. Shell scatter – **33.46.589S; 25.42.874E**

- Shell scatters.
- Low sensitivity, a general IVB/C site and should be recorded before destruction.

Some 100 metres north-east of the pottery scatter at the foot of a high dune was a thin *Perna perna* shell scatter. A few bone fragments were the only other remains associated with the shell (Figs 81-82).

Figs 81-82. The shell scatter with bone fragments at site 4.

5. Midden scatters – from **33.46.692S; 25.42.148E to 33.46.662S; 25.42.125E**

- Midden scatters
- Low sensitivity, a general IVB/C site and should be recorded before destruction.

A continuous scatter of *P. perna* shell was spread along the exposed calcrete floor of a long narrow deflation bay running from north to south (Figs 83-84). Several small thicker circular concentrations of shell, which may represent individual sites, were recorded by GPS. Apart from a few pottery fragments and the occasional quartzite stone tool, no other food waste or cultural materials were found. There was not enough evidence to date the sites, but the presence of a few pot sherds, may suggests that some of the sites may be of KhoiSan origin.

Figs 83-84. View of the deflation bay and the midden scatters at site 5.

Middle beach and coastal foreland

This area is situated between the beach and a strip of inland shifting sand dunes. The area is highly disturbed and included the SeaArk plant, the abalone farm and a network of roads, cutting through dense almost impenetrable alien vegetation (Figs 85-86). Due to the dense vegetation which covered the coastal foreland from almost the high water mark, it was impossible to find any archaeological sites. During 1994 an area with midden scatters were recorded at the far end of the vegetated coastal foreland (Maps 10-11). However this site could not be located during the recent survey and must be covered by dune sand and vegetation.

Figs 85-86. Views of the middle beach and coastal foreland.

Eastern beach and dune area

The eastern side of the property between the inland dunes and the beach was a wide, open, flat sand field with small low dunes (Map 11). Along this area were calcrete and quartzite gravels exposed by the wind. Among these gravels were occasional stone tools, chunks and flaked pieces (Figs 87-88). Unfortunately these exposed gravels also provide hard surfaces for vehicles to drive on. All sites situated here were damaged/demolished by off-road vehicles (Figs 89-90). Occasional randomly scattered stone tools were found at:

33.46.234S; 25.44.209E, 33.46.194S; 25.44.246E, 33.46.116S; 25.44.377E and between **33.46.009S; 25.44.513E** and **33.46.000S; 25.44.578E.**

Figs 87-88. View of the eastern beach and dune area with expose calcrete gravel.

Figs. 89-90. Damage caused to the exposed gravel s by vehicles.

6. Small midden scatters – **33.46.692S; 25.42.148E**

- Midden scatter
- Low sensitivity, a general IVB/C site and should be recorded before destruction.

A small scatter of *P. perna* shell was located near the foot of the inland shifting sand dune. Apart from a few quartzite stone flakes, no other materials were found (Figs 91-92).


Figs 91-92. Small shell scatter and the exposed calcrete floor in the background along the dune fringe.

7. Stone tools on exposed calcrete floor - **33.46.056S; 25.44.373E**

- Midden scatter
- Low sensitivity, a general IVB/C requires no further recording before destruction.

A few Later and Middle Stone Age stone tools were found on the exposed calcrete floor along the fringe of the inland dunes, some hundred metres from Site 6 (Figs 93-94).


Figs. 93-94. Exposed calcrete floor with Later and Middle Stone Age stone tools.

Inland area

The inland area behind the shifting dunes was investigated, but the dense impenetrable vegetation made it impossible to find any archaeological sites (Figs 95-98).

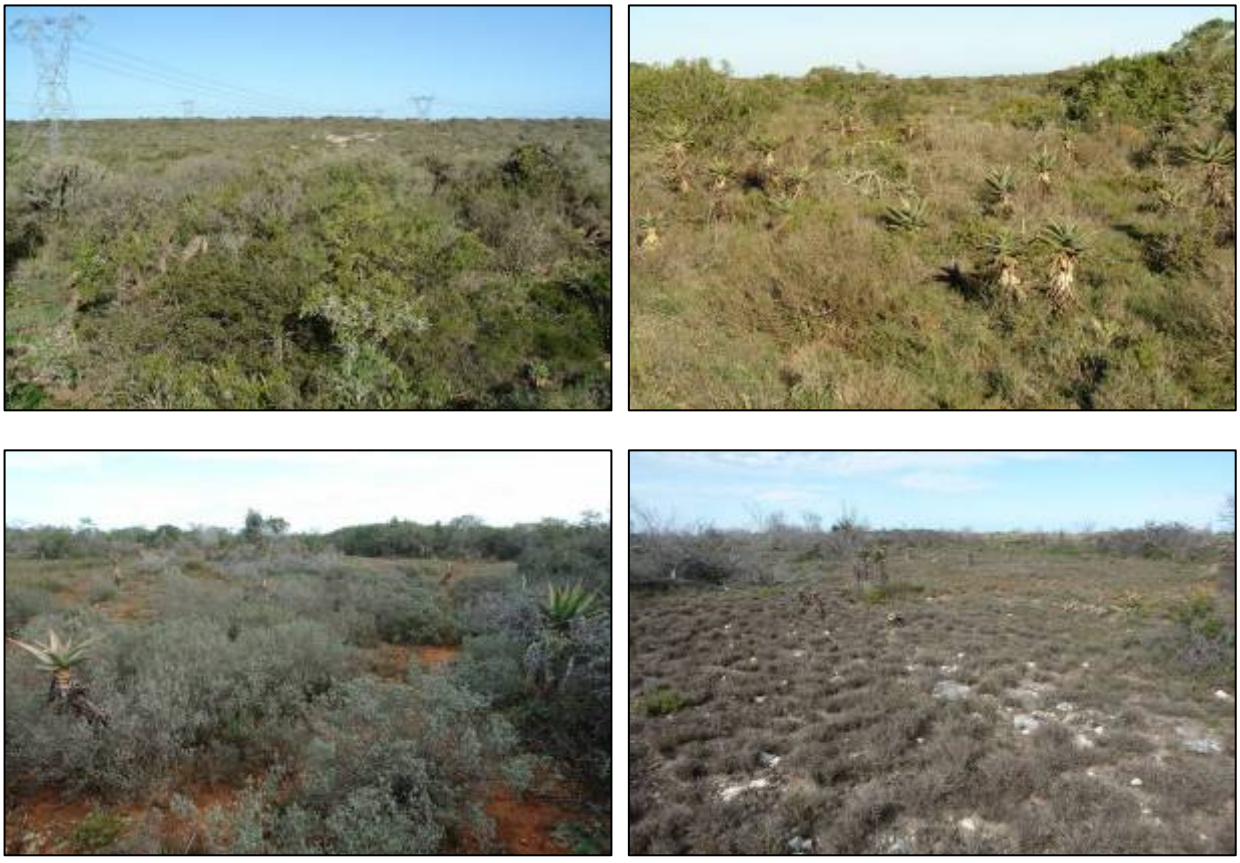
Figs 95-98. Different views of the dense inland vegetation.

ZONE 11

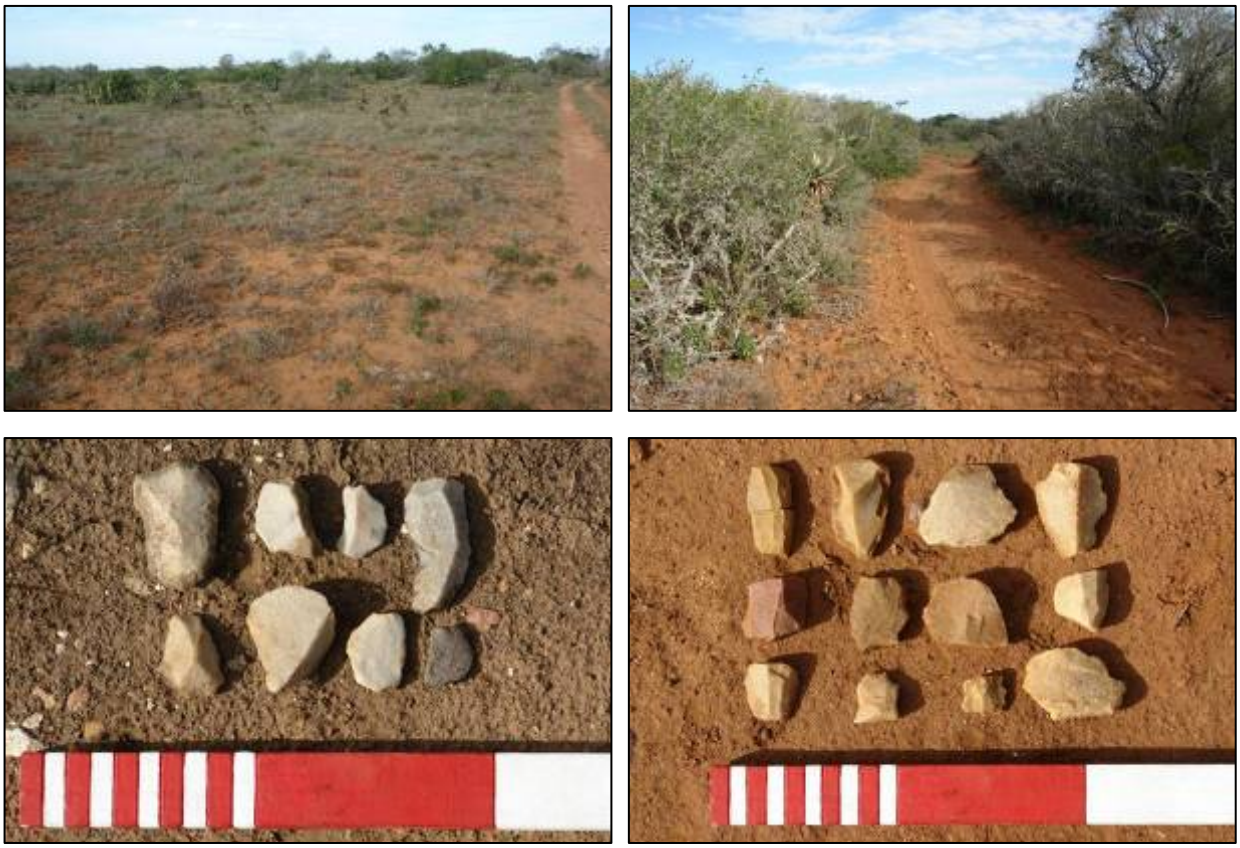
Zone 11 is situated between Zone 12 and 6 and forms part of the north-eastern boundary of the IDZ (Map 1, 2, 3 & 6). Apart from road and pipeline construction at the western side/boundary of Zone 11 and power lines which cross through the zone, the remainder appears to be relatively undisturbed, i.e., there is no large scale development in this zone yet. Zone 11 is very similar to the other adjacent zones. Most of the zone was used mainly for grazing and related farming activities (farm houses and buildings have been demolished) (Figs 99-102).

Most of the southern parts of the zone is covered by dense thicket vegetation, but give way to dense short grass towards the north. This appears to be related to the presence/absence/depth of the red and grey top soils overlying the calcrete (Figs 103-106). In places, the calcrete is exposed and/or covered in a thin layer of quartzite pebbles/cobbles gravel. Stone tools were found throughout the zone, but the density and type may vary from place to place. For example, where pebble/cobble gravels are exposed in the red soils, the number of stone tools will be 'higher' than areas where calcrete floors are exposed. The majority of the stone tools were mainly of Earlier and Middle Stone Age and occasional Later Stone Age origins (Figs 107-110). The stone tools which comprised quartzite flakes, chunks, flaked pebble/cobble and cores were randomly distributed across the landscape and are in secondary context. There were no 'concentrations' of tools observed which suggested any spatial patterning or activity areas, although these may be present or covered by soil and vegetation. It was however, noticed that there was an increase in stone tools in the track near an old dry pan area (GPS reading 33.43.152S; 25.41.458E). Although this may not have been a pan/wetland thousands of years ago, it would appear to have been a preferred area for occupation. There are several of these 'pan areas' and are visible on an aerial image of the zone and spatial patterns of stone tools may be present at, or near these features.

Figs 99-102. Different views of road and pipe line construction along the western side of zone 11 and small scale disturbances by power line and farming activities.



Figs 103-106. Views of the different vegetation types and sedimentology/geology in Zone 11. Dense thicket vegetation, red soils and exposed calcrete.



Figs 107-110. Views of an old pan area and examples of the Middle Stone Age stone tool exposed in the red soils by a vehicle track.

ZONE 12

Zone 12 constitutes the far northern boundary of the IDZ and is situated north of the railway line to Port Elizabeth (Maps 1, 2, 3 & 9). Most of this large zone was used for farming activities, probably mainly grazing and apart from a power sub station and power lines which runs roughly from east to west over the landscape, it is relatively undisturbed. Several tracks run through the zone and wide strips were bulldozed at a rectangle from north-west to north-east, probably for future road construction. Calcrete is the dominant geological deposit in the zone and is either exposed or covered by a thin layer of soil. The area is covered by dense grass, bush and thicket vegetation, which made it difficult to find archaeological sites/materials (Figs 111-116). Isolated quartzite Middle Stone Age stone tools similar to those in other zones were found where pebble/cobble, but were not recorded.

Figs 111-112. Views of the power lines and the power sub station and in Zone 12.

Figs 113-116. Different views of the vegetation and road construction in Zone 12.

ZONE 13

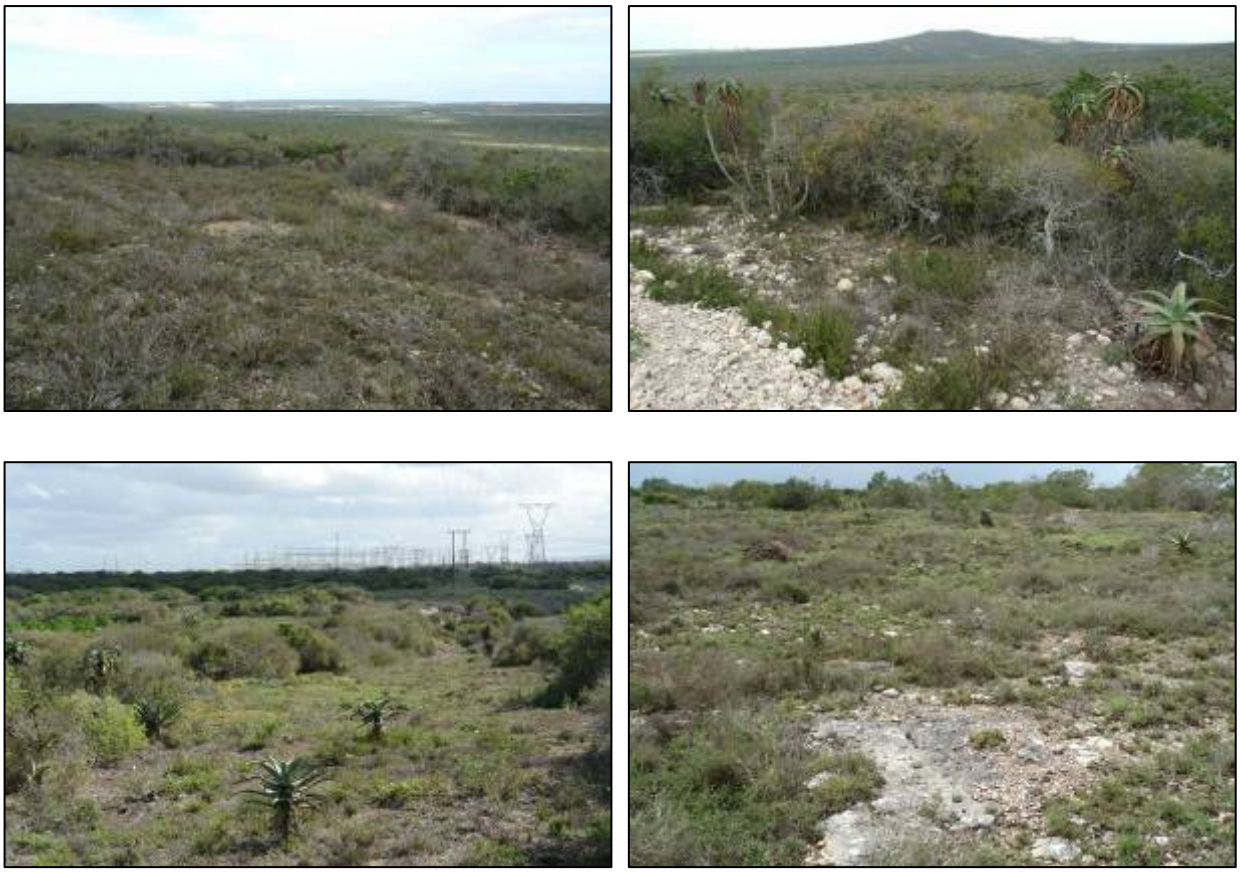
Zone 13 is a narrow strip sandwiched between zones 9, 11 and 14 and comprises mainly the upper Coega River valley with relatively steep sides (Maps 1, 2, 3 & 9) (Figs 117-120). The valley has been disturbed in the past with the construction of the railway line and gravel roads. An archaeological impact assessment was conducted for the peaking power plant site in 2006. This plant and associated infrastructure has subsequently been constructed. The peaking plant and other developments have taken place mainly on the high relatively flat plateau overlooking the Coega River valley (Figs 121-124). The remainder of the zone towards the north is relatively undisturbed.

The zone is well covered with low grass, dense patches of bushes, small trees and impenetrable thicket vegetation, which made it difficult to find archaeological sites/materials. Occasional stone tools were found during the survey for the peaking plant where pebble/cobble river gravels were exposed. The stone tools found were mainly small quartzite flakes, some were well weathered and displayed typical Middle Stone Age facetted striking platforms and features. Apart from the stone tools no other visible archaeological sites/material were found during the investigation.

Figs 117-120 (top two rows). General views of the Zone 13 landscape. Note the dense vegetation. Figs 121-124 (two bottom rows). Views of the newly constructed peaking power plant and associated infrastructure developments. An example of the Middle Stone Age stone tools found during the survey on the peaking plant property.

ZONE 14

Zone 14 is a large area and comprises the north-western part of the Coega IDZ (Maps 1, 2, 3 & 9). The zone is very similar to Zones 12 and 11. In general most of the zone appeared to be undisturbed and was mainly used for grazing and small scale farming activities. Disturbances are mainly from tracks and power lines which cross the area and the Grassridge power sub station along the north-western boundary. Calcrete is exposed in most of the zone or covered by a thin layer of soil. The dense grass and bush and thicket vegetation made it difficult to find archaeological sites/materials (Figs 125-132). Notwithstanding, Earlier and Middle Stone Age stone tools were found where pebble/cobble river gravels are exposed in tracks (GPS reading, 33.44.676S; 25.37.642S) (Fig 129-130). As was the case in Zone 11, stone tools increased in the vicinity of an old pan area (GPS reading, 33.44.422S: 25.27.939) (Figs 131-132).



Figs 125-128. General views of different vegetation types Zone 14 and the. Note the dense thicket vegetation and the exposed calcrete floor.

Figs 129-130. A track cutting through dense impenetrable thicket and Middle Stone Age stone tools found in the exposed pebble/cobble gravel. Note the impenetrable thicket vegetation.

Figs 131-132. Views of possible Earlier Stone Age and Middle Stone Age tools found in exposed reddish pebble/cobble gravel in a tracks next to a pan area in Zone 14.

DISCUSSION

Most of the more than 9 200 hectares of the Coega IDZ is covered by dense low and high grass and impenetrable thicket vegetation, which made it difficult to find archaeological sites/materials. Although most of the inland areas of this large property (the inland zones) are relatively undeveloped, it has been disturbed in the past by small scale farming activities, and more recently by power line and road construction. In a few of the zones large areas have been cleared of vegetation and large scale developments have taken place. These cleared areas provided windows to search for archaeological sites and materials which were not possible due to the dense vegetation. Unfortunately the areas are so disturbed by other infrastructural developments such as drainage channels, pipelines, buildings, power lines and other activities that any archaeological sites/materials which may have been present were destroyed.

Although the area/zones investigated were occupied extensively in the past (judging from the large quantity of flaked stone randomly scattered throughout the area), it would appear that the area is relatively poor in large and important archaeological sites. However, many sites/materials and human remains may be covered by soil and vegetation. These may only be exposed when development takes place, as is evident in Zone 7 where archaeological remains were exposed when an area was cleared by bulldozers for the construction of a road.

The most important archaeological sites were found along the coast (on NPA property) and included mainly shell middens which date from the past ca 8-6 000 years. Similar sites in the shifting sand dunes and coast east of the harbour area were much smaller in size, depth of deposit, quality and quantity of food waste and cultural material. These archaeological features usually are found between two to five kilometres inland from the coast. The large scale developments which have taken place in areas close to the coast, such as Zone 1, may have destroyed many of these features. Roads and large drainage channels were constructed a few hundred metres from the beach and over sand dunes. No HIA/AIA was conducted (CDC HIA ToR).

Earlier, Middle and Later Stone Age stone tools were found throughout the Coega IDZ where pebble/cobble gravel were exposed. However, no spatial patterning or activity areas such as ‘manufacturing’ sites were located, although such sites may exist, they are not visible. All stone tools were in secondary context and not associated with any other remains. They are of low significance, but concentrations of stone tools may be buried, especially areas around pans, for example in the inland zones 6, 11, 12 and 14.

DISCUSSION AND RECOMMENDATIONS

During the past few years large scale developments and constructions of roads, railway lines, buildings and other infrastructure projects took place in the Coega IDZ. However, Heritage Impact Assessments (HIA's) did not form part of the Environmental Impact Assessments (EIA's) that were conducted for these projects.

HIA's were only conducted by investors who are located in the Coega IDZ, but did not necessary include all projects as is clear from the literature search (for example the construction of the Coega Business Centre). Thus, this would imply that the majority of the large scale development/construction projects in the past took place without any compliance with the National Heritage Resources Act of 1999 (NHRA). Against this background it is recommended that;

1. The South African Heritage Resource Agency (SAHRA) urgently visit the Coega IDZ to gain first hand information on the status of the developments that took place in the past and those which are planned in the near future.

2. Meet with the Coega Development Corporation to discuss on what authority they ignored the legislative requirements of NHRA and how it will be honoured in the future. Follow-up meetings/visits must take place annually.

3. SAHRA must investigate if the recommendations which were put forward in the HIA's and AIA's for developments in the Coega IDZ were implemented.

The specialist archaeological study of the Coega IDZ and the proposed harbour area which was commissioned and undertaken by the archaeologists at the Albany Museum in 1996 (Binneman and Webley 1997), focused mainly on the estuary and adjacent coastal region rather than on the entire zone. The reasons for doing so were (i) that there was no reason to suppose that the rest of the 10 000 ha property would include similar important cultural sites as found along the coast (ii) that most of the area was covered by impenetrable thicket vegetation, and (iii) it was not possible for two archaeologists to survey such a huge area properly.

During 1997, Dr J. Deacon, previously of the National Monuments Committee (now SAHRA) was approached by the CSIR Division of Water, Environment and Forestry Technology at Stellenbosch, to peer review and to comment on the report by Binneman and Webley (1977).

Deacon commented on the absence of a complete survey of the Zone, noting that it was difficult to determine whether this would have implications for the future. One of the implications of the Coega IDZ is that all archaeological sites in the Zone will eventually be damaged or destroyed during the course of development. For this reason she recommended that:

"it is vital that project-specific EIA's be done for each development so that an accurate record is kept of all archaeological sites. Planning for future stages of development must therefore include mandatory provision for the survey of sites once the vegetation cover has been removed, and for the subsequent mitigation of sites that may be considered significant. She recommended that archaeologists be consulted whenever specific sites are to be developed and should be informed when any sites are found accidentally".

This view of Deacon eventually also became the approach accepted and recommended to be followed by the consultants regarding HIA's for the Coega IDZ.

The Coega IDZ is a large area and comprises more than 9 200 hectares (excluding the NPA property), of which most is covered by dense and/or impenetrable thicket vegetation. Technically speaking, an archaeological site can comprise a single stone artifact, and stone tools are randomly scattered throughout the entire Coega IDZ. Not only is it difficult, but impossible to record all the visible 'sites', but there are also those sites which are buried, which will only be found when exposed. These constraints are the main factors why it is almost impossible to conduct a comprehensive archaeological impact assessment. To complete a straightforward walk through of the entire area would take 10 professional archaeologists several months to complete. The cost of such an operation is not financially viable. Therefore it is suggested;

1. The Coega Development Corporation employs an archaeologist full-time to conduct all future HIA/AIA surveys for the many developments that will take place. This would be a cost-effective measure when the recommendations below are considered.

The development of the area will result in considerable earth-moving and landscaping of the terrain. If there are any significant buried archaeological sites, they are likely to be destroyed. It is important to remember that archaeological and historical sites are non-renewable. Once destroyed, they cannot be returned to their original state. For this reason every effort must be made to monitor the site during earth-moving development/activities. Against this background it is recommended that;

1. The original Deacon recommendations that **project-specific EIA's be done for each development so that an accurate record is kept of all archaeological sites** be retained. Note that HIA's are part and parcel of EIA's.

2. All developments as specified by NHRA must be registered to SAHRA in advance as required by NHRA and no development may take place before comments and recommendations have been received from SAHRA.

3. All construction work, including drilling operations must be monitored. It is suggested that HIA's be conducted only after the final footprints and related infrastructures are available. If preliminary investigations of properties are requested, then a walk through by an archaeologist must be conducted again when the final footprint is available. This must take place before clearing of vegetation starts, where the vegetation allows for such an investigation. The clearing must also be monitored and all activities thereafter.

4. An archaeologist must inspect the construction site when the topsoil and surface vegetation is removed to establish if there are any archaeological sites/materials. If any sites are exposed, then the work must be stopped to allow an archaeologist to investigate the finds. Recommendations will follow after the investigation and may include:

    - A Phase 2 mitigation process may be introduced whereby systematic excavations/sampling will be conducted to establish the contextual status of the sites and possibly remove the archaeological deposits before construction of the development starts.

5. The site must be monitored during all construction work, i.e. leveling, trenching etc. and should any further archaeological remains be encountered, the work must be stopped to allow an archaeologist to investigate the finds. Recommendations will follow after the investigation and may include:

    - A Phase 3 Mitigation process to systematically excavate and remove the archaeological deposits before construction of the development continues.

6. Zones 1, 7 and 10 are next or close to the coast and are regarded as sensitive areas and all activities must be monitored. In future the vegetation must be cleared by hand and not by earth removing equipment. The archaeologist could make alternative recommendations regarding the clearing methods after inspection of the terrain. An archaeologist must be present/inspect all phases of the development.

7. Clearing procedures for the other zones must follow the recommendations of the archaeologist.

8. If any concentrations of archaeological material are exposed during construction, such as large accumulations of marine shell, fossil bone (1 m^2 and larger) and human remains, all work in that area should stop and it should be reported immediately to the nearest museum/archaeologist or to the South African Heritage Resources Agency so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to remove/collect such material (See Appendix B for a list of possible archaeological sites that maybe found in the area).

9. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

Suggestion

1. Against the background of the above recommendations and the financial implications the Coega Development Corporation should consider to employ an archaeologist full time to manage the archaeological heritage estate of the Coega IDZ.

2. If any mitigation takes place and archaeological materials must be removed, these must be housed in a heritage facility or exhibition in an appropriate area within the Coega IDZ.

3. If the Coega Development Corporation is aware of any private collections of archaeological material from the Coega IDZ, ‘owners of such collections are urged to register and obtain the necessary permits from SAHRA to legally ‘own them.

The minimum standard guidelines required by the South African Heritage Resources Agency for compiling Archaeological Heritage Phase 1 Impact Assessment (AHIA) reports, also requires that not only the footprint be assessed, but also the wider region/property. In this regard it is also recommended that SAHRA request:

1. In addition to the recommendations outlined for the construction of the proposed storm water outlet for Zones 1 and 2 that will be constructed through the dunes to the beach along the boundaries of the Coega IDZ, NPA and NMM, that:

    - The National Ports Authority allow a comprehensive archaeological study (excavation, sampling and dating of the Later Stone Age shell middens) of the coastal region west of the harbour. These important archaeological features are close to the area where the proposed water outlet for Zones 1 and 2 that will be constructed and these sites may be damaged (Appendix 1).

GENERAL REMARKS AND CONDITION

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, reflect the true state of affairs. Many sites/features may be covered by soil and vegetation and will only be located once this has been removed. In the event of such finds being uncovered, (such as during any phase of construction work), archaeologists must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed. The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999.

It must also be clear that Archaeological Specialist Reports (AIA's) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should grant a permit or a formal letter of permission for the destruction of any cultural sites.

APPENDIX A: brief legislative requirements

Parts of sections 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

Archaeology, palaeontology and meteorites

35 (4) No person may, without a permit issued by the responsible heritage resources authority—

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

Burial grounds and graves

36. (3) *(a)* No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
(c) bring onto or use at a burial ground or grave referred to in paragraph *(a)* or *(b)* any excavation equipment, or any equipment which assists in the detection or recovery of metals.

Heritage resources management

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of the site –
    (i) exceeding 5000m^2 in extent, or
    (ii) involving three or more erven or subdivisions thereof; or
    (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
    (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;
(d) the re-zoning of a site exceeding 10 000m^2 in extent; or
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

APPENDIX B: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM COASTAL AREAS: guidelines and procedures for developers

1. Shell middens

Shell middens can be defined as an accumulation of marine shell deposited by human agents rather than the result of marine activity. The shells are concentrated in a specific locality above the high-water mark and frequently contain stone tools, pottery, bone and occasionally also human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m^2 in extent, should be reported to an archaeologist.

2. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

3. Fossil bone

Fossil bones may be found embedded in calcrete deposits at the site. Any concentrations of bones, whether fossilized or not, should be reported.

4. Stone artefacts

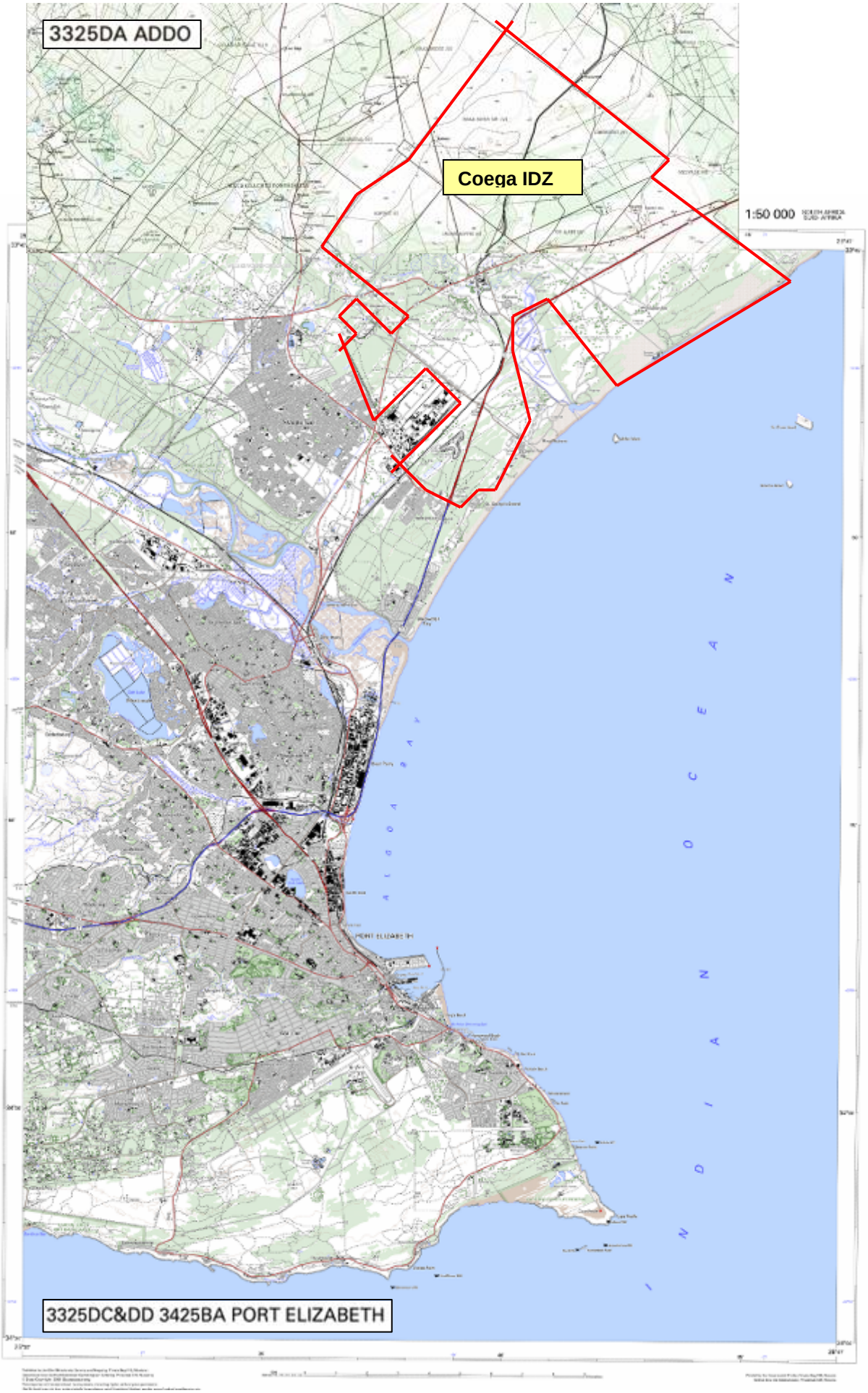
These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified.

5. Stone features and platforms

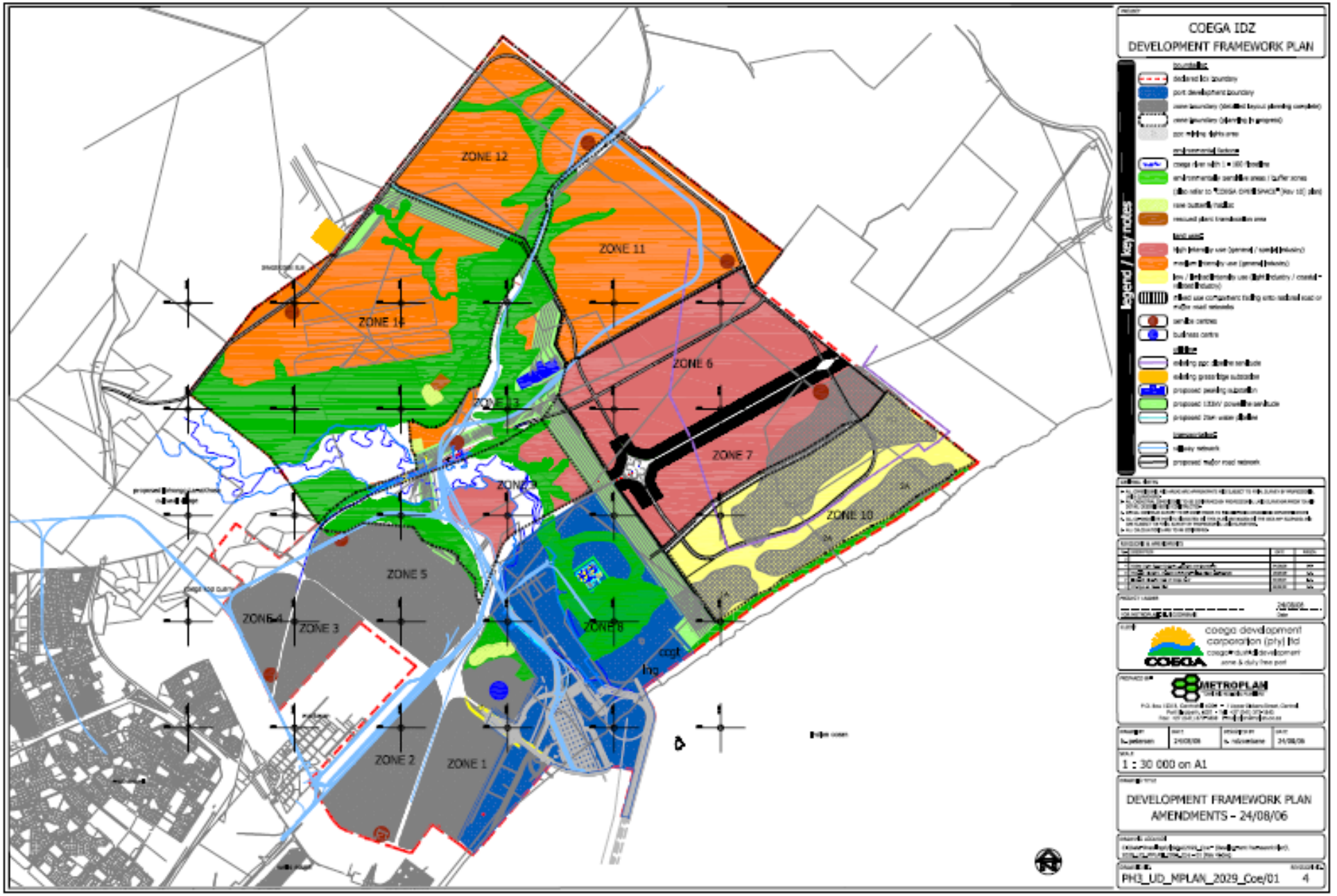
They come in different forms and sizes, but are easy to identify. The most common are an accumulation of roughly circular fire cracked stones tightly spaced and filled in with charcoal and marine shell. They are usually 1-2 metres in diameter and may represent cooking platform for shell fish. Others may resemble circular single row cobble stone markers. These are different sizes and may be the remains of wind breaks or cooking shelters.

6. Historical artefacts or features

These are easy to identified and include foundations of buildings or other construction features and items from domestic and military activities.

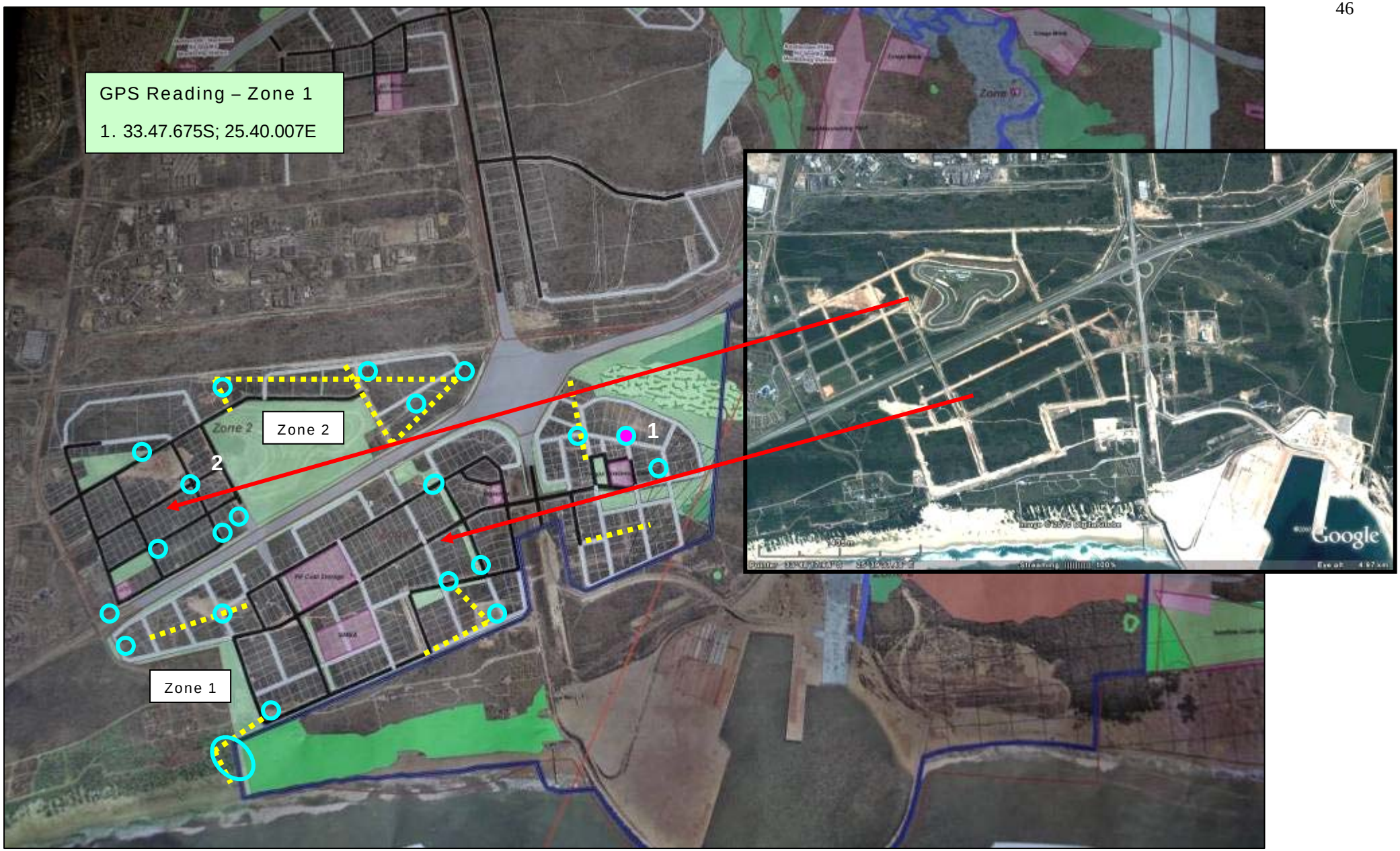


Map 1. 1:50 000 Map indicating the location of the Coega Industrial development Zone. The red lines outline the approximate boundaries of the Coega IDZ.

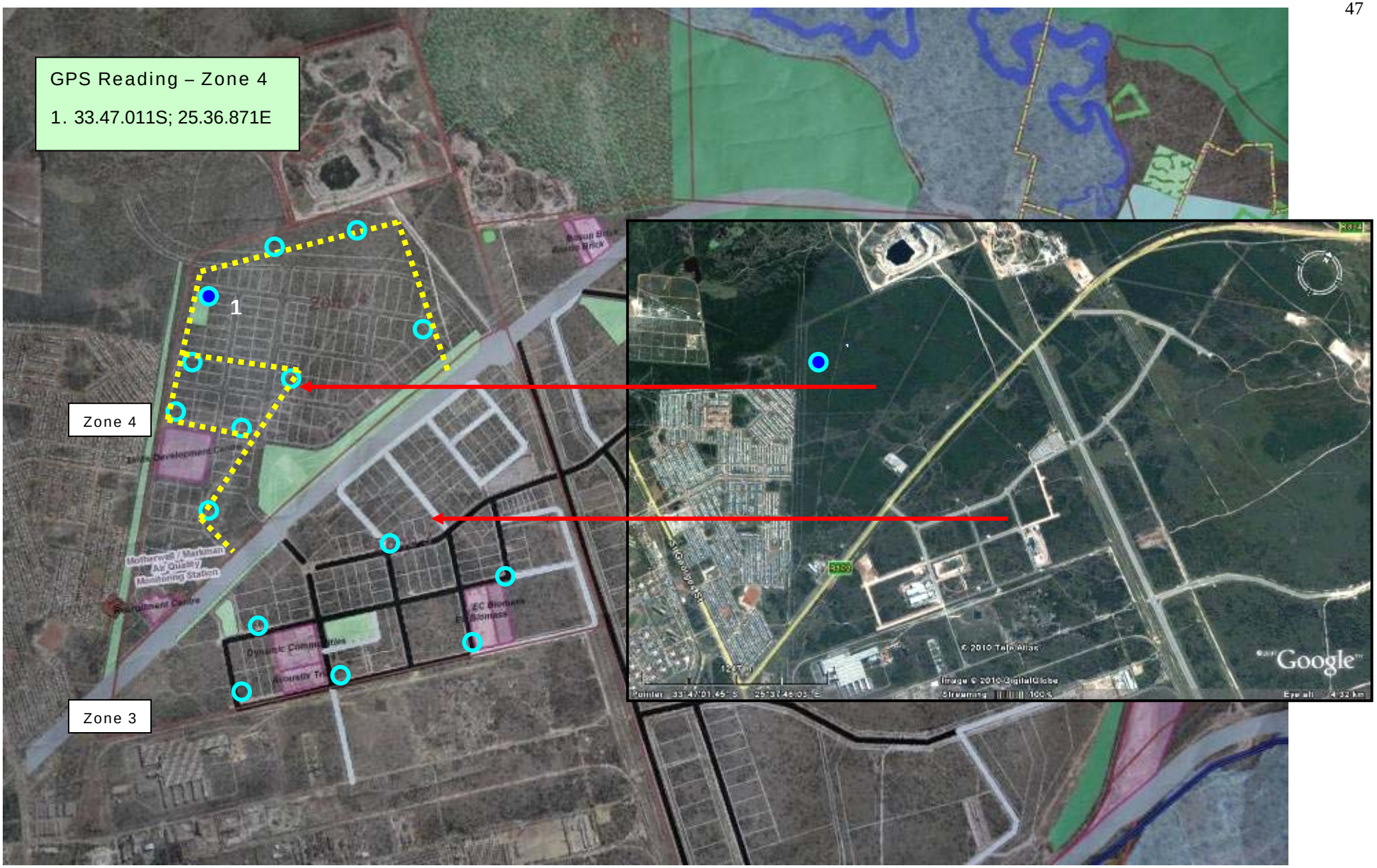


Map 2. Map of the location and layout of the Coega Industrial Development Zones (map courtesy Coega Industrial Development Corporation).

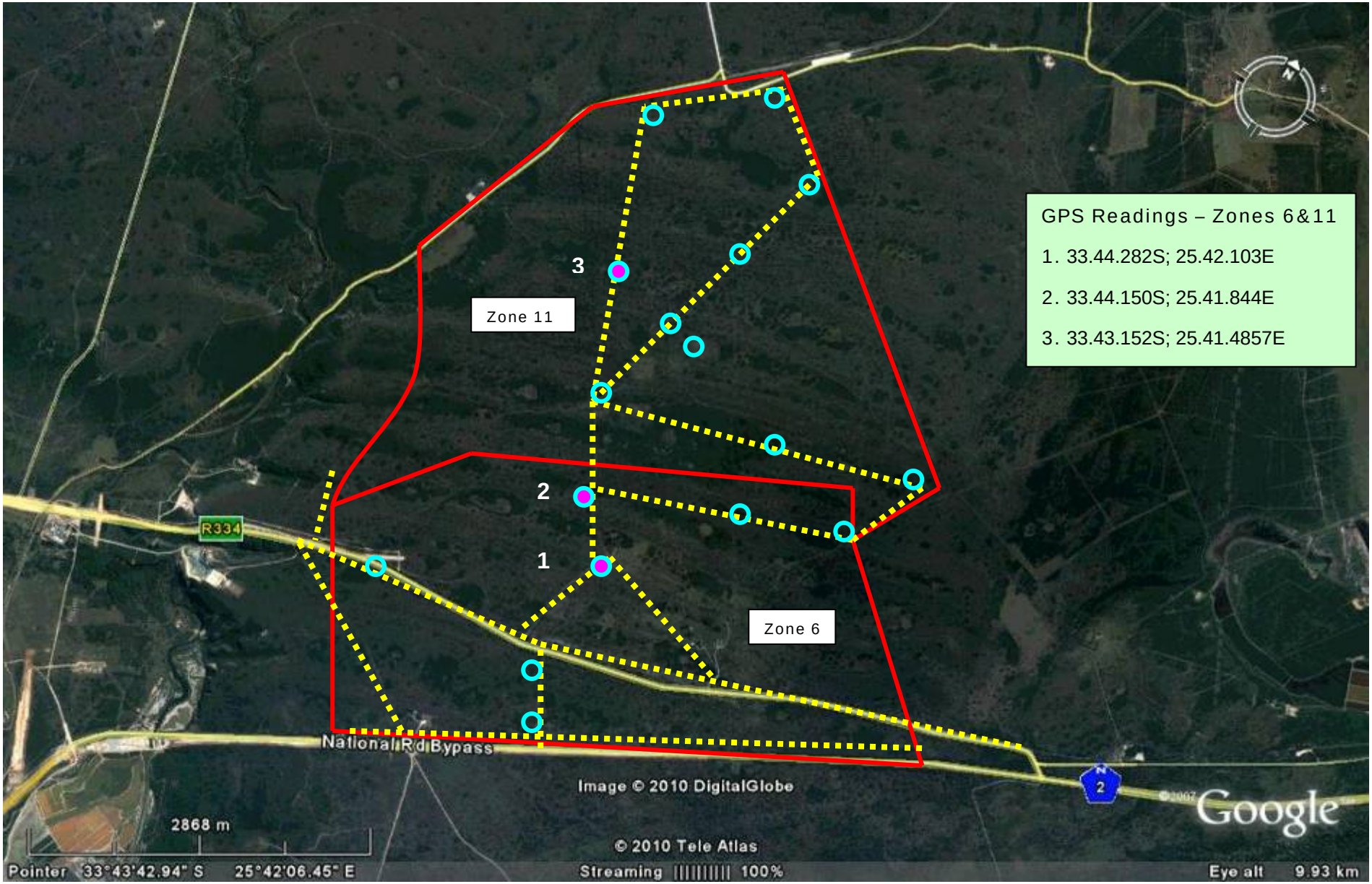
Map 3. Aerial map of the location of the Coega Industrial Development Zones. The red lines mark the approximate size of the different zones.



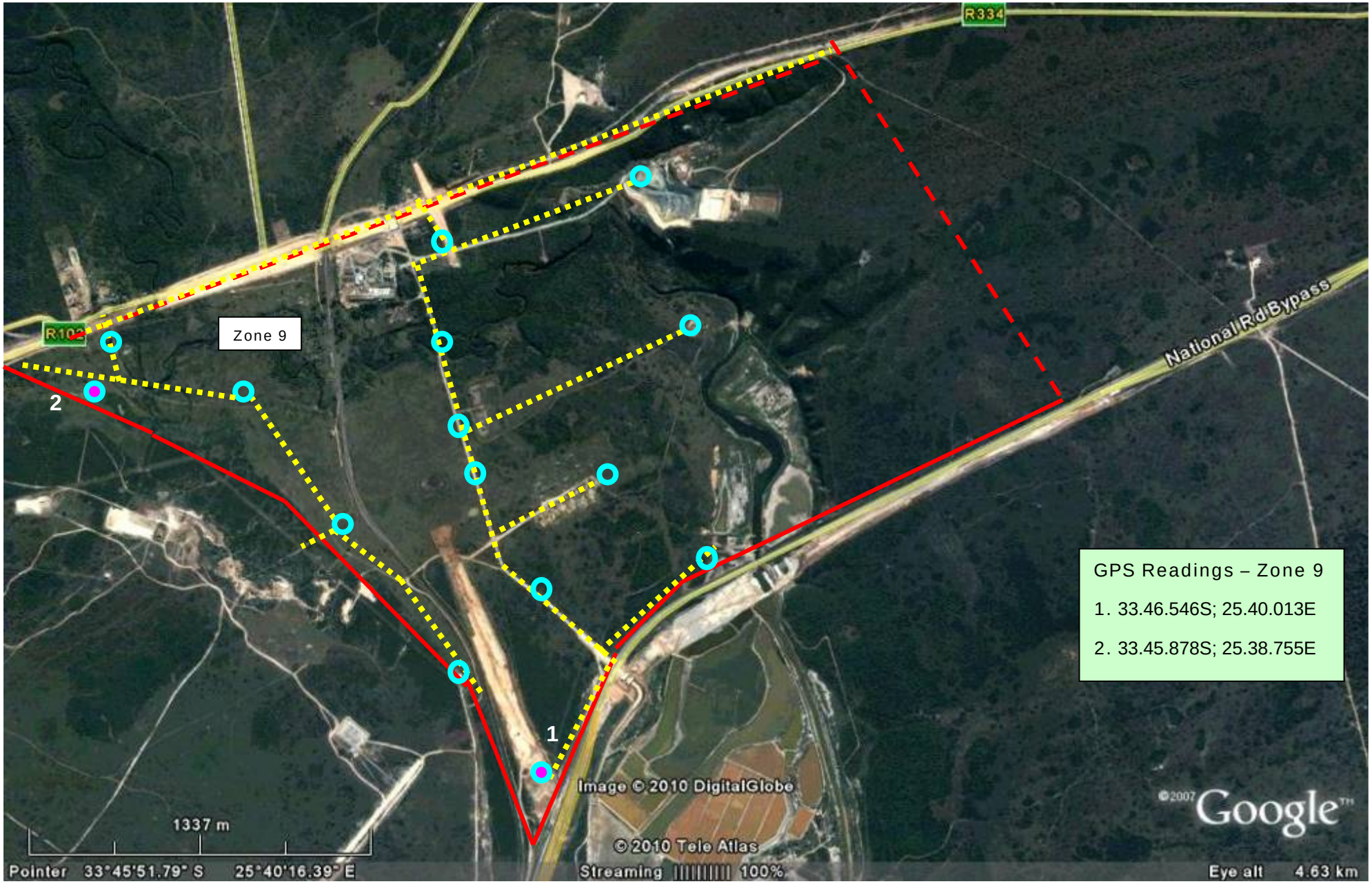
Map 4. Aerial photographs of Zones 1 and 2. The main image indicates the current state of the development of roads and other related infrastructure. The black lines and pink blocks mark the completed projects ca 2009 and the grey lines projects planned for the near future. The Google image displays the development in progress ca 2007. The black lines and yellow broken lines indicate the survey and 'spot check' routes. The light blue circles indicate survey and 'spot check' areas and the pink dot marks the area where the sample of Middle Stone Age stone tools was recorded.



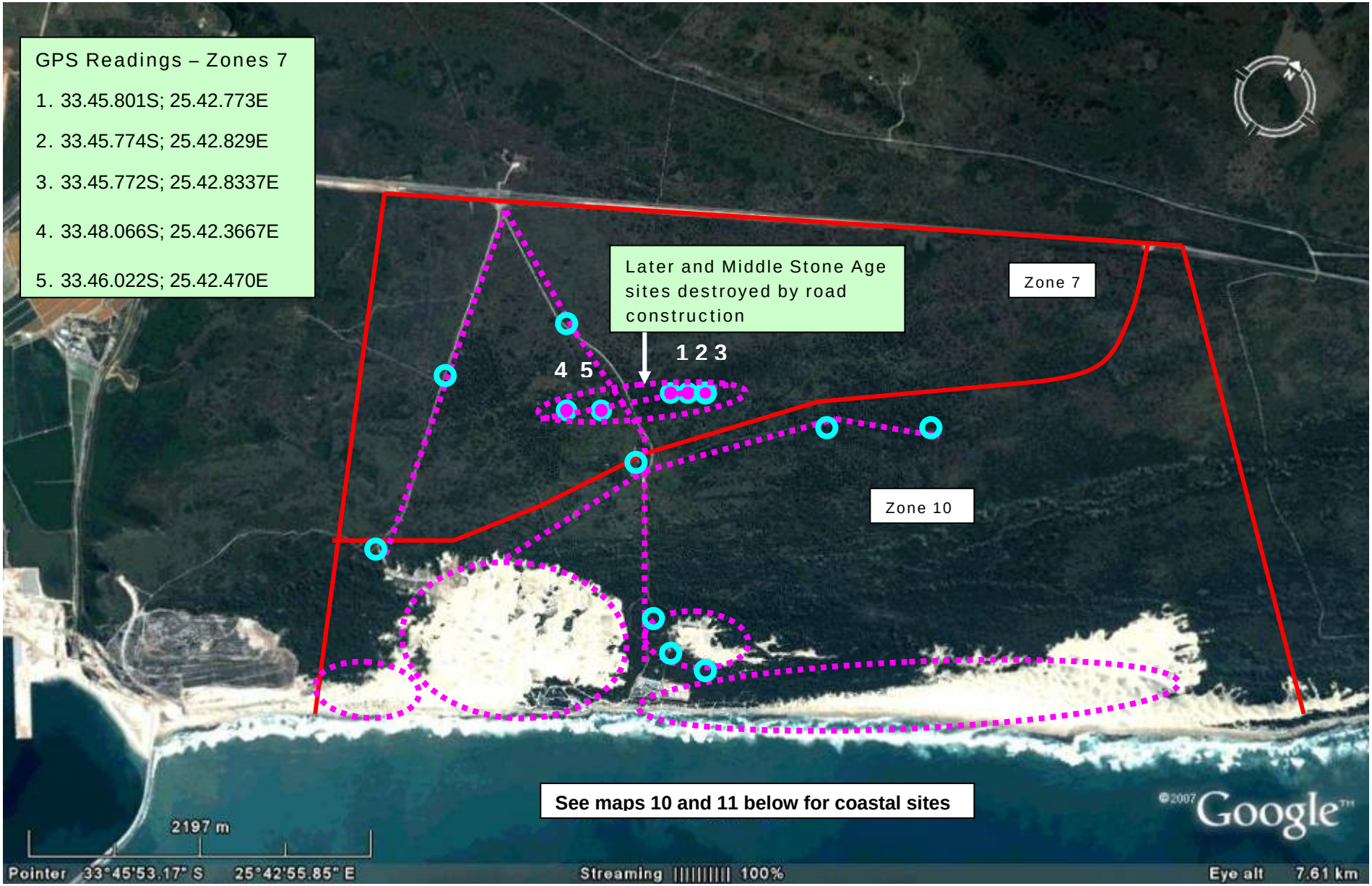
Map 5. Aerial photographs of Zones 3 and 4. The main image indicates the current state of the development of roads and other related infrastructure. The black lines and pink blocks mark the completed projects ca 2009 and the grey lines projects planned for the near future. The Google image displays the development in progress ca 2007. The black lines and yellow broken lines indicate the survey and 'spot check' routes. The light blue circles indicate survey and 'spot check' areas. The blue dot marks the quarry.



Map 6. Aerial photographs of Zones 6 and 11. The red lines mark the approximate size of the different zones. The yellow broken lines indicate the survey and 'spot check' routes. The light blue circles indicate survey and 'spot check' areas. The pink dots marks the area where the Middle Stone Age stone tools were recorded

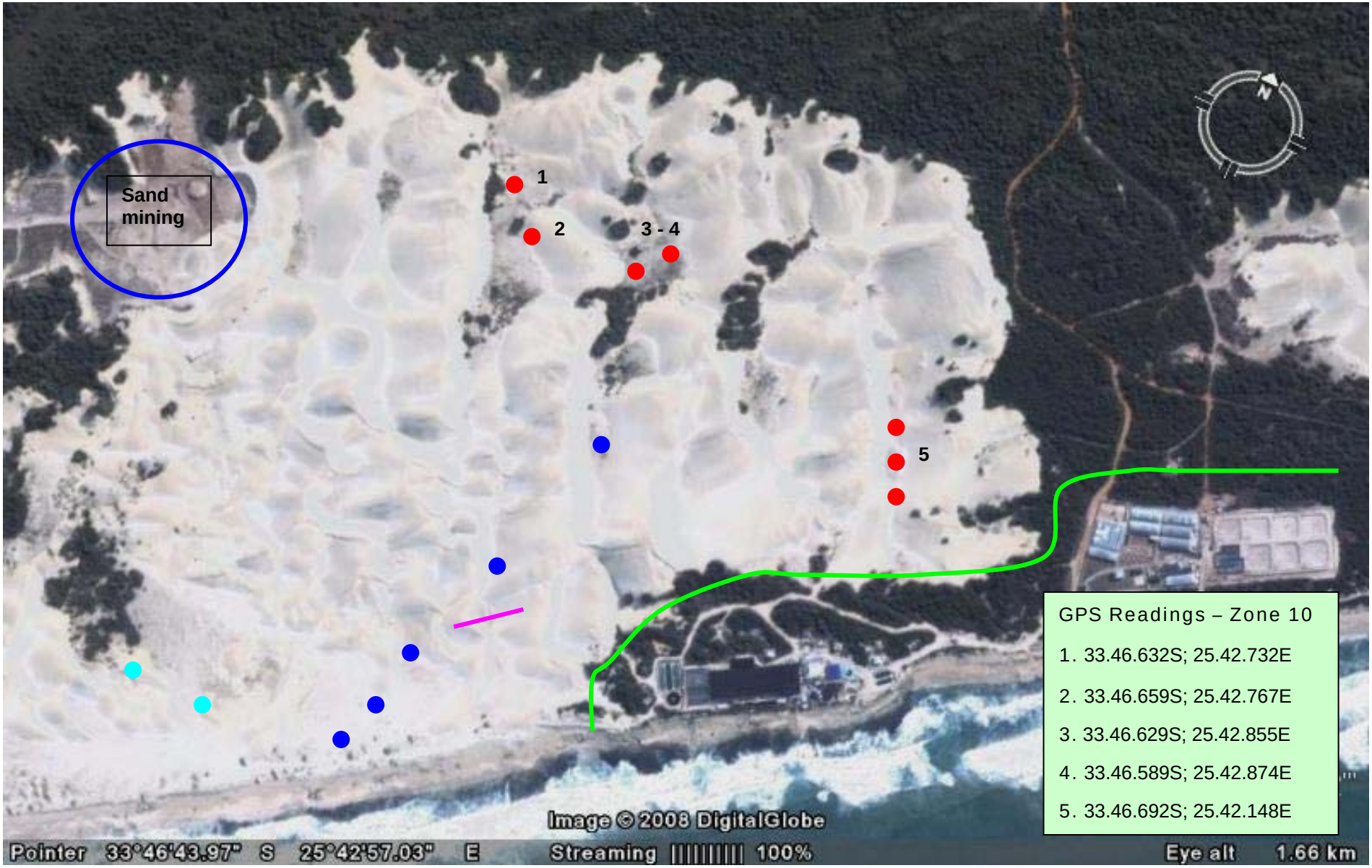


Map 7. Aerial photograph of the location of Zone 9.The red lines outline the approximate size of the zone and the yellow broken lines mark the survey and 'spot checks' routes. The light blue circles indicate survey and 'spot check' areas and the pink dots mark where the Middle Stone Age stone tools were recorded

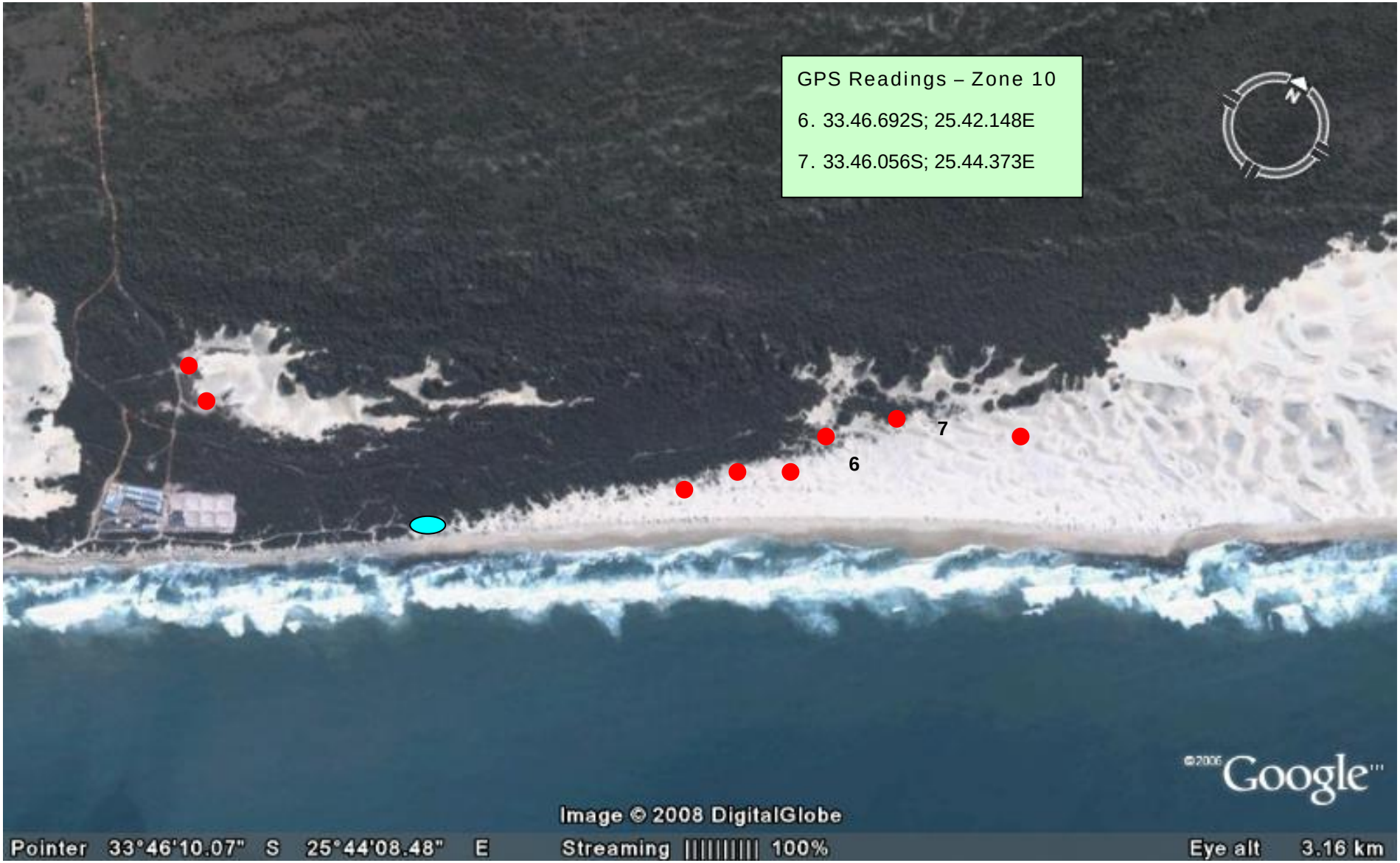


Map 8. Aerial photograph of the location of Zone 7 and 10.The red lines outline the approximate size of the different zones and the pink broken lines mark the survey and 'spot checks' routes. The light blue circles indicate survey and 'spot check' areas and the pink dots mark where Later and Middle Stone Age materials were found.

Map 9. Aerial photograph of the location of Zone 12,13 and 14. The red lines outline the approximate size of the different zones and the yellow broken lines mark the survey and 'spot checks' routes. The light blue circles indicate survey and 'spot check' areas and the pink dots mark where the Middle Stone Age stone tools were recorded



Map 10. Aerial photograph of the location of archaeological sites in the shifting dune area of Zone 10. Highly disturbed area, Possible area where human remains were found, Sites recorded during 1994 by JB, Sites recorded during 2007 by LW, Additional sites recorded during 2008 by JB. Note: most of the blue sites could not be located during a recent visit and must be covered by dune sand.



Map 11. Aerial photograph of the location of archaeological sites and material along the eastern part of the dune area of Zone 10. Shell midden scatter and stone tools recorded in 1994 by JB, but was unable to find it again during recent survey, Additional sites recorded during a recent survey by JB