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No. 12,047

EL 4110, EL 4111 AND EL 4114

NAARACK, MABEL CREEK AND WINTINNA

**RESPECTIVE FINAL REPORTS AT LICENCES' JOINT
SURRENDER, FOR THE PERIOD 26/3/2008 TO 2/4/2010**

Submitted by
Diatreme Resources Ltd
2010

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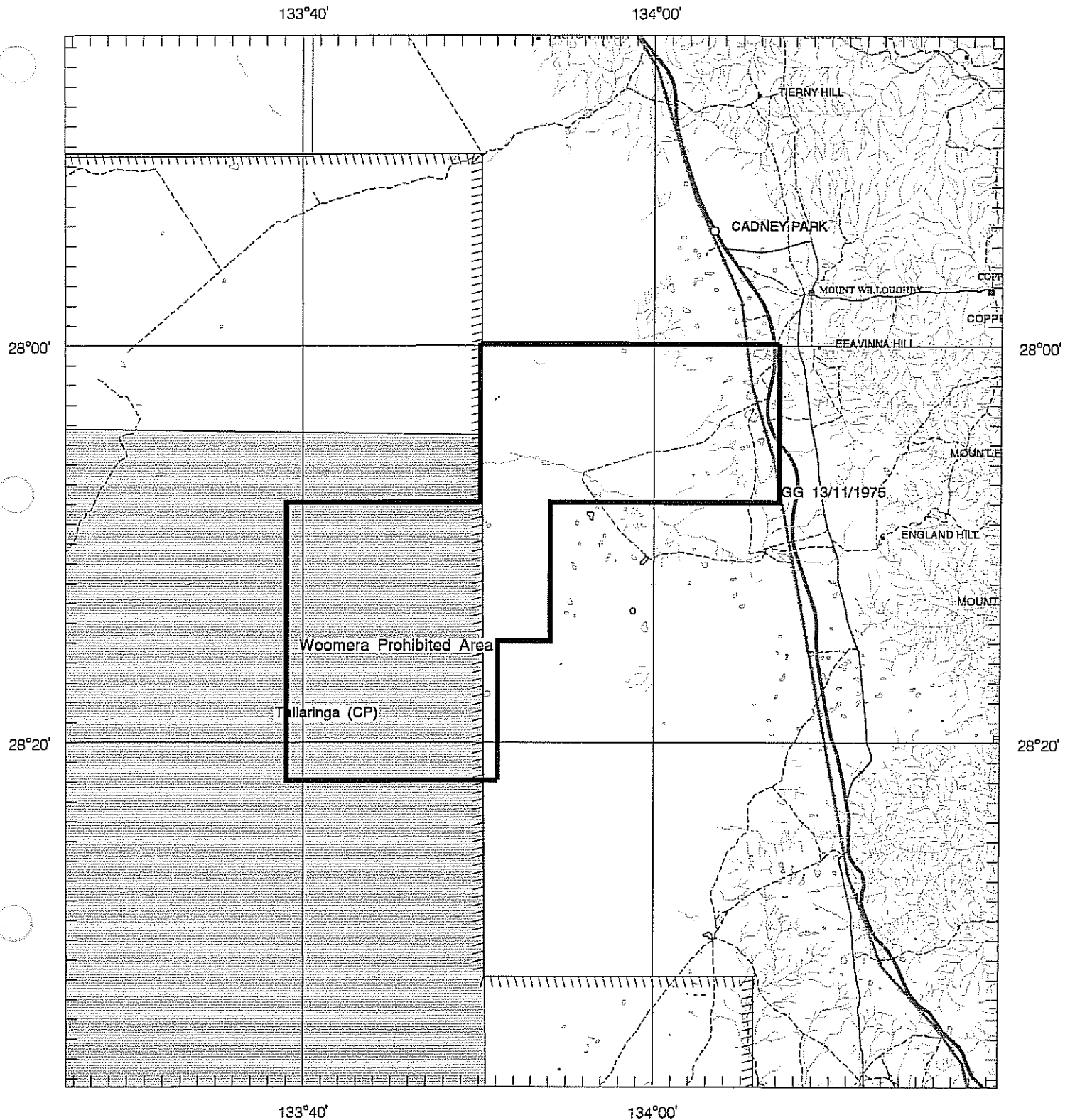
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7th Floor
101 Grenfell Street, Adelaide 5000

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Facsimile: (08) 8204 1880



Government of South Australia
Primary Industries and Resources SA

SCHEDULE A



SCALE 1: 500 000

KILOMETRES 10 0 10 20 30 40 50 KILOMETRES

LICENCE GRANTED IN : DATUM AGD66



APPLICANT : **DIATREME RESOURCES LTD**

FILE REF : **423/07**

TYPE : **MINERAL ONLY**

AREA : **979 km² (approx.)**

1:250000 MAPSHEETS : **WINTINNA MURLOOCOPPIE**

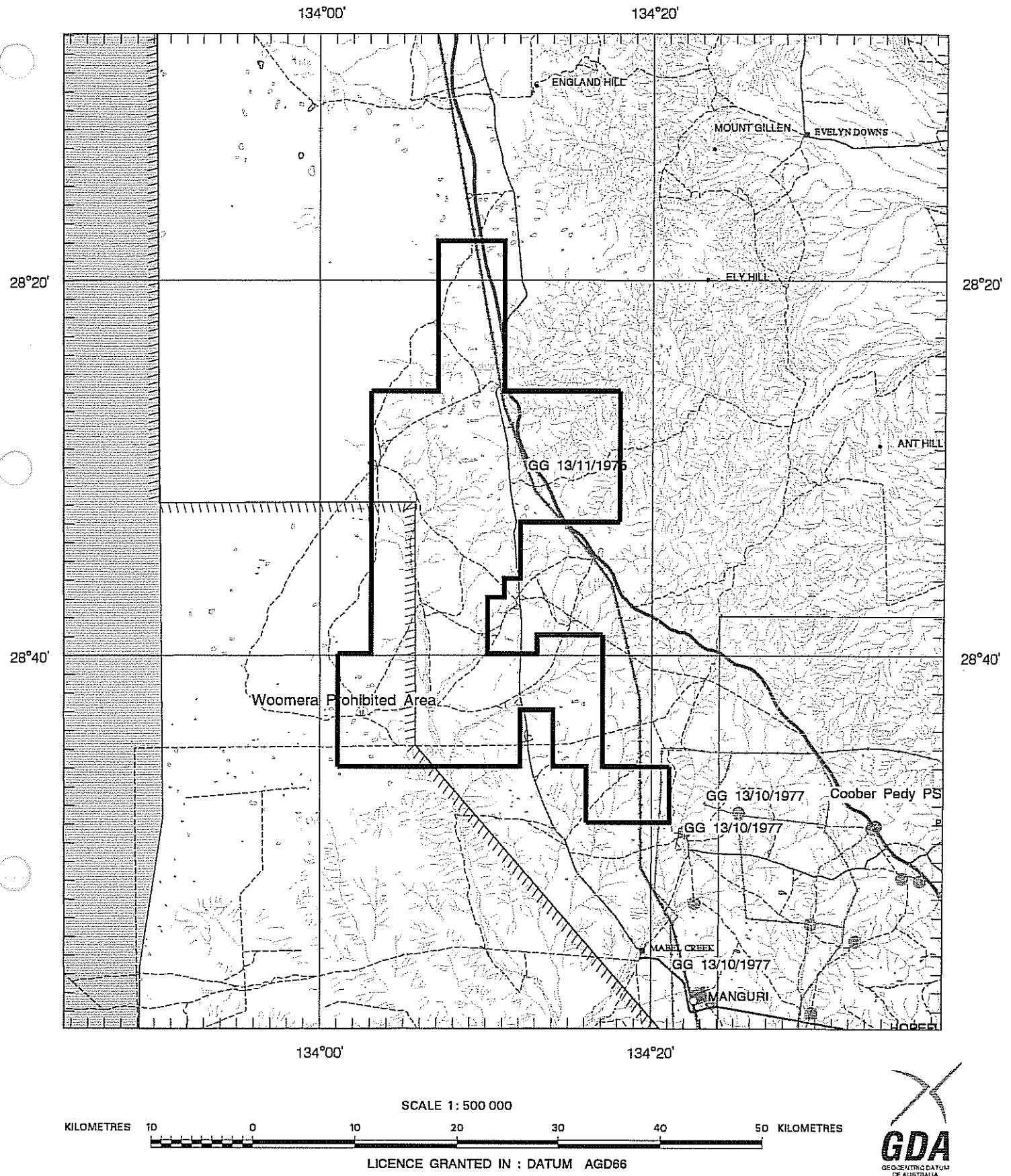
LOCALITY : **NAARACK AREA - Approximately 130 km west of Coober Pedy**

DATE GRANTED : **26-Mar-2008**

DATE EXPIRED : **25-Mar-2009**

EL NO : **4110**

SCHEDULE A



APPLICANT : DIATREME RESOURCES LTD

FILE REF : 424/07

TYPE : MINERAL ONLY

AREA : 902 km² (approx.)

1:250000 MAPSHEETS : MURLOOCOPPIE

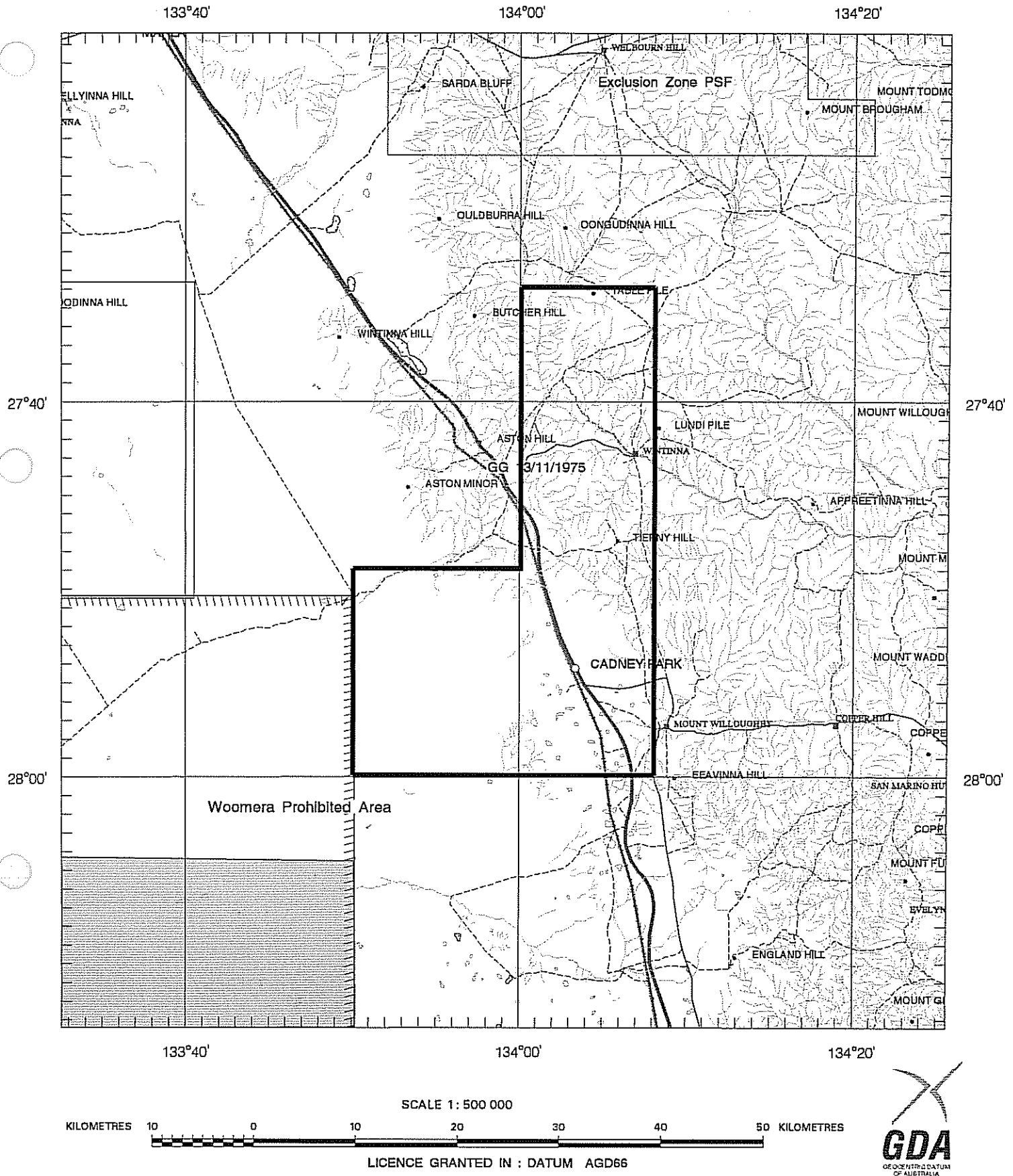
LOCALITY : MABEL CREEK AREA - Approximately 80 km west of Cooper Pedy

DATE GRANTED : 26-Mar-2008

DATE EXPIRED : 25-Mar-2009

EL NO : 4111

SCHEDULE A



APPLICANT : **DIATREME RESOURCES LTD**

FILE REF : **427/07**

TYPE : **MINERAL ONLY**

AREA : **959 km² (approx.)**

1:250000 MAPSHEETS : **WINTINNA**

LOCALITY : **WINTINNA AREA - Approximately 145 km north of Coober Pedy**

DATE GRANTED : **26-Mar-2008**

DATE EXPIRED : **25-Mar-2009**

EL NO : **4114**



DIATREME RESOURCES LIMITED

EL4110

Final Report
26/03/2008 – 2/04/2010

Arckaringa Basin Project

Author: David Jelley, April 2010

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SUMMARY

Diatreme Resources Limited (Diatreme) has completed one drilling programme over EL4110 since it was granted in 2008. During the first twelve months of the licence, extensive effort was directed towards gaining access to Native Title Lands. Air core drilling commenced in October 2009, after successful access negotiations and cultural heritage surveys had been carried out. A total of two holes over 106.5 metres were drilled during the exploration programme.

It was believed this tenement could be prospective for mineral sands although no prior exploration has been directed towards this commodity previously in this area. Petroleum companies have explored the area for oil and coal.

Diatreme has used interpreted digital elevation model (DEM) data to determine regional targets outside known depositional basins to define potential concentrations of heavy mineral sands. A program of stratigraphic drilling was completed along existing station tracks but failed to locate any signs of heavy mineral sands or favourable stratigraphic horizons for such. Additionally, the west portion of the tenement lies within the Tallaringa Conservation Park and the Woomera Prohibited Area both of which severely limit access to the area. As a result the tenement has been relinquished entirely.

KEYWORDS: South Australia, Arckaringa Basin, EL4110, Arckaringa Project, Heavy Mineral Sands, Diatreme Resources Limited, Air core drilling.

2 LOCATION AND ACCESS

Access to the tenement is via the Stuart Highway from either Coober Pedy in the south or Marla in the north. Figure 1 & Figure 2 show EL4110 mostly lies to the west of the highway with its eastern boundary straddling the highway.

Cadney Park homestead (road house) is situated approximately 10km to the north of the tenement.

The property boundary fence between Wintinna Station and Mt Willoughby station was used for access and served as the drilling traverse.

The western portion of the tenement lies within the Tallaringa Conservation Park which inhibited access. The Woomera Prohibited Area also shares a common boundary with the Tallaringa Conservation Park which also has access restrictions.

3 TENEMENT DETAILS

EL4110 was granted to Diatreme Resources Limited for a period of twelve months as set out in the table below. This tenement lies within the Arckaringa Project Area with a number of other Diatreme tenements and combined reporting for the project was granted to Diatreme on the 24th April 2009 with a reporting date to 25th March.

Table 1. EL4110 Tenement Information

Project	Tenement Name	Application Number	Exploration Licence Number	Area (km ²)	Grant Date	Expiry Date	Expenditure Commitment PA
Arckaringa Basin							
	Naarack	2007/423	EL4110	979	26/03/08	25/03/10	\$125,000

4 PREVIOUS EXPLORATION WITHIN THE REGION

4.1 Other Companies

Most of exploration to date in the Arckaringa Basin Project area has focused on coal, gas and petroleum and some engineering works.

Commonwealth Railways Geotechnical Drilling

Commonwealth Railways conducted a small geotechnical drilling programme in the early 1970's for the construction of the Tarcoola-Alice Springs Railway. This programme was in the northern part of EL4111. The holes were no deeper than 60m and their focus was on the strength of the rocks. There is a report on SARIG, ref RB 75/00048.

Coal Drilling by BP and Santos, mid 1970's

In the mid 1970's BP and Santos conducted separate drilling programmes in tenements to the west of EL4111.

BP drilled several lines of shallow holes (up to 120m) to the south and west of the tenements currently held by Diatreme. They found poor quality (high sulphur, moderate ash and non swelling) sub-metre thick coal seams at depths about 50m.

Santos drilled four 100m holes near BP's and did not encounter any coal at all.

In both cases the holes were fairly shallow, and were not of sufficient depth to intersect the seams that have subsequently been discovered.

Coal drilling by Meekatharra Minerals Ltd, 1980's

Meekatharra Minerals conducted a drilling programme in the early 1980's overlapping the BP programme from the 1970's. These holes were drilled to a greater depth than those drilled by BP, up to 200m. Only basic stratigraphic logs are available from SARIG without precise details of depths and thicknesses of seams. Several holes intersected coal seams at about 170m, although there is no data available about the thickness, quality or precise depth. Only three holes were drilled inside tenements held by Diatreme and there are two on the boundary. The basic stratigraphic logs for holes MR107-110 do not mention coal; however, MC176 has a seam of shaley coal somewhere between depths of 152-177m.

Drill holes MC163 & 164 and MR165-168 (drilled in 1982), also contain coal somewhere in the vicinity of 150-170m. These holes are of particular interest as they are at the site of a proposed coal mine. They are located between EL's 4110 and 4111, at Westfield, longitude 134.09, latitude -28.22. Altona Resources, the owners of the current tenement, are conducting a drilling programme, looking at converting coal to petrol and building a power station.

Comalco Drilling Programmes

In and around the Diatreme tenements there are several holes drilled by Comalco in the 1980's. The MANYA, LAMBINA, MARLA, NICHOLSON, GILES, EMU and MUNAROO series have been drilled to a depth close to 2km, targeting petroleum. Information for this programme is in envelopes 3938, 4073 and 6259. One envelope

has been destroyed, envelope 5073. No coal seam is mentioned in the logs; however, there have been assays for copper, zinc and lead, with a significantly high anomaly in all holes in member 4 of the Observatory Hill Beds. There was also an irregular Copper pattern in the deeper Cadney Park Information. More information is in the report Base Metal Chemical Data from Eastern Officer Basin Drill Holes in envelope 3938 and in the individual borehole summaries.

These holes also have geophysical logs available, paper copies of which are stored in envelopes 6259 and 3938. There are also computer tapes; however, copies of these will have to be ordered from PIRSA.

There are several lines of fairly shallow holes that were drilled in the early 1980's to depths of up to 130m. These holes were drilled for explosive shots for their seismic programme. The chips were analysed for copper, zinc and lead and the results are in envelope 3938. There is a high anomaly of copper (up to 1000ppm, but most assays are lower than 200ppm) at about 70m in most holes, corresponding to the Observatory Hill Beds. These holes did not encounter any significant coal seams, although this may be due to the shallow depth of the holes.

In 1982 Comalco also conducted a drilling programme targeting coal in the Arckaringa Basin. They found seams in the Mt Toondina Formation. In the tenement 695, approximately 35km to the east of EL4114, some of the seams are up to several metres thick. These seams are quite variable in thickness and quality and are at depths greater than 150m, with the thickest and highest quality being those at the top. In their tenements 1069 and 1072-3, partially overlaying EL's 4114 and 4110, Comalco found coal to be shallowest and thickest in the east and becoming deeper and thinner to the west, with no intersection with coal in their easternmost and northernmost holes.

These holes were sampled and analysed for inherent moisture, per cent ash, volatiles and fixed carbon. It was found to have ash between 3 and 10%, with an average about 7%. A few samples were analysed for specific energy and were found to be fairly high, with an average around 20 MJ/Kg. Two samples were analysed for Sulphur, and although they were very low (0.3 and 0.6%) this cannot be used to indicate Sulphur levels for the whole area. Refer to *Technical Report of the 1982 Drilling Programme, EL695* and *Lithological Report Arckaringa Basin Coal* in envelope 6259.

Seismic Surveys, Gravity and Magnetism – Comalco

In the 1980's, Comalco conducted a geophysical programme to compliment its drilling programme. They conducted seismic surveys across much of tenements EL's 4110-4114. There is no mention of coal in the seismic survey report, although the area where coal has been discovered was not surveyed. There is discussion about the presence of loose sand and sandstone in the top 70m or so causing problems with the survey, which could be promising for the mineral sands project.

Comalco also did magnetic and gravity surveys. They discovered a magnetic anomaly to the east of EL4113 in the expired tenements of EL1070 and EL1071 although this was not followed up with drilling.

Currently, no heavy mineral sands exploration has been conducted in the Arckaringa Basin.

5 EXPLORATION BY DIATREME RESOURCES

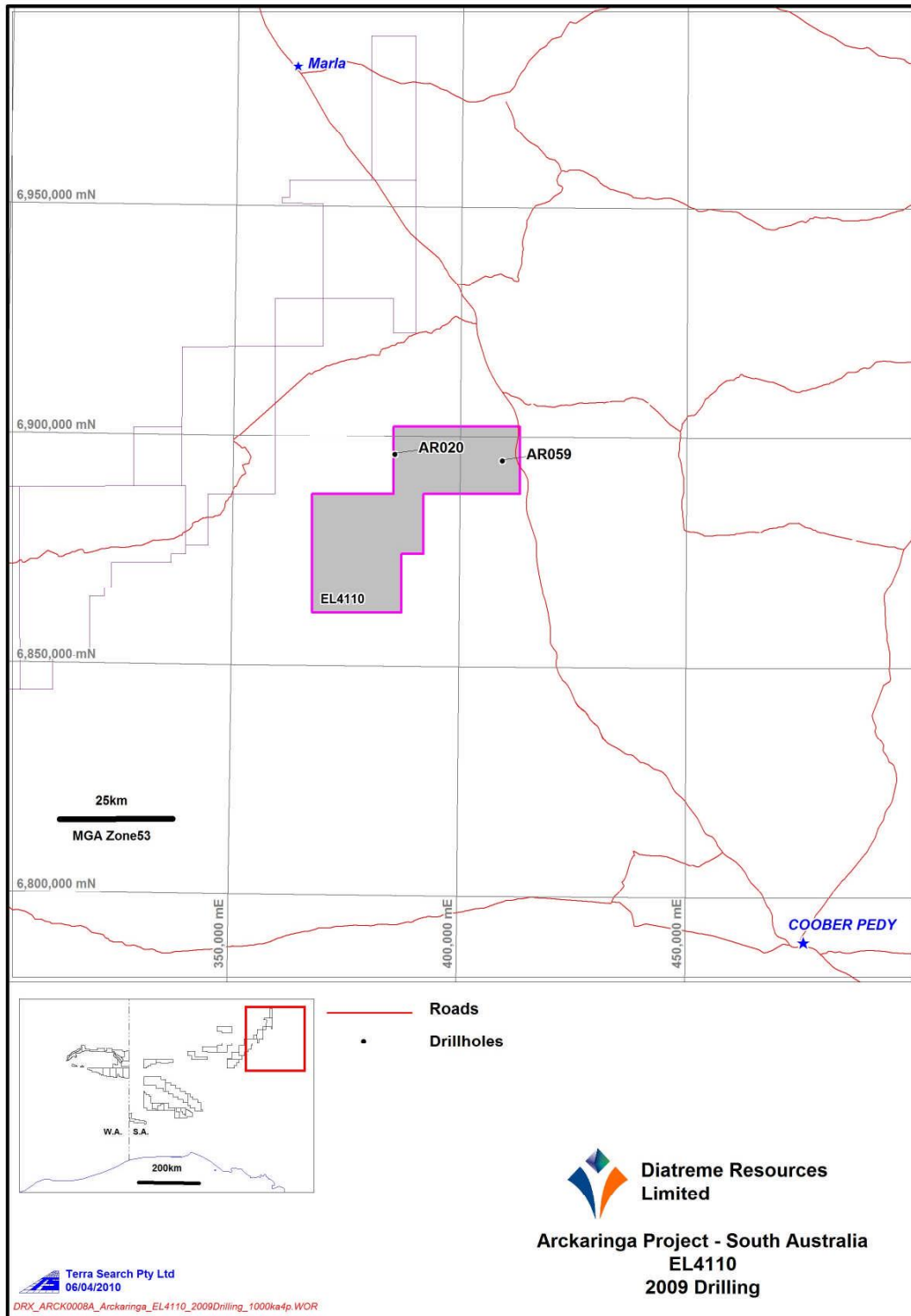
Diatreme has only conducted limited exploration over EL4110 since it was granted in early 2008. Exploration is summarised below.

Year 1: Exploration on ground could not be undertaken during the first year of the tenement due to difficulties in gaining access to the ground despite exhaustive efforts in 2008 and early 2009. Previous exploration reports and data were reviewed in preparation for drilling.

Year 2: A cultural heritage survey was carried out in April 2009 over all proposed drilling lines. An EWA reflecting the outcomes of discussions with various parties concerning environmental and native title/cultural heritage issues, was approved by PIRSA and exploration drilling was carried out over EL4110 between the 15th October and 3rd November, 2009. Air core drill holes were drilled along existing tracks utilising a company owned drill rig. A total of 106.5 metres drilled within two drill holes were completed on EL4110 during this programme. Holes were between 33m and 73.5m deep and spaced 24km apart. No trace of mineralisation was located and the stratigraphy was deemed unprospective for heavy mineral sands.

The expenditure during the two year the tenement was active is listed in Table 2 below. The majority of this expenditure is related to traversing the ground to find access routes for drilling, cultural heritage surveys and aircore drilling.

Figure 2: Drilling within EL4110, Arckaringa Project, South Australia.



6. GEOLOGY

6.1 Regional geology

The Arckaringa Basin is a Permo-Carboniferous intracratonic basin which covers an area of approximately 80,000km². Mostly restricted to the subsurface it comprises a central platform of gently undulating shallow crystalline basement surrounded by troughs. Permian sediments are thin or absent over the central platform. The two major depocentres are the Boorthanna and Phillipson Troughs developed principally along northwest trends. They contain up to 1,300m of Permo-Carboniferous sediments and are underlain unconformably by up to 880m or more of ?Devonian, early Palaeozoic and Precambrian sediments and metasediments. Permian sediments are overlain by up to 300m of Late Jurassic to Early Cretaceous Eromanga Basin and generally less than 10m of Tertiary cover.

Initiation of the Boorthanna Trough may be related to extension of the Adelaide Geosyncline. Faulting is thought to have been synchronous with deposition. Seismic and palynological data indicate thinning over structural crests and local intra-Permian uplift and erosion.

Deposition commenced following widespread glaciation and a marine transgression, probably from the south. Termination of marine sediments was brought about by crustal isostatic recovery or eustatic fall bringing about a return to freshwater conditions with development of coal swamps. Sedimentation ceased as a consequence of positive epeirogenic movement at the end of the Early Permian.

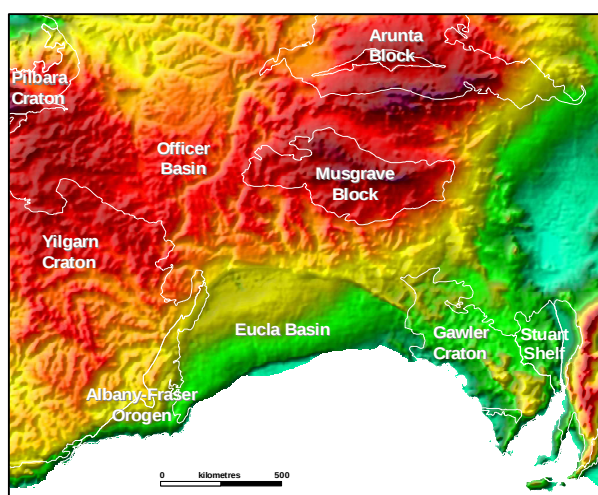


Figure 3. A Digital Elevation Model identifying major palaeoriver systems that enabled sediment transportation into the Eucla and Arckaringa Basins from the surrounding Archean/Proterozoic cratons.

Gravity and Magnetics – PIRSA

There is a high gravity anomaly in a NE-SW direction, mostly within tenements 2007/418-25. There is also a magnetic high to the north of the gravity anomaly, most of which is within the tenement 252/97, not owned by Diatreme. Smaller anomalies exist along the front of ELs 4110-4113. It seems likely that the large gravity anomaly and the smaller magnetic anomalies are associated with the edge of the Arckaringa Basin. In 1982, Comalco commissioned a report (Interpretation of Regional Gravity

Data, NE Officer Basin) which concluded that the gravity high was possibly due to a thinning of the crust and mafic intrusions caused by an intra continental rift.

Very little is actually known about the cover over the Arckaringa Basin, which will be the subject of exploration for heavy mineral sands. It is assumed by Diatreme that the proto Eucla Basin may have extended into the tenement package before the Eocene. There are a number of palaeorivers evident from the DEM shown in Figure 3, that drain the Musgrave Block which would have provided significant quantities of heavy minerals and if the sea did encroach this far inland, there would have been a concentrating mechanism with longshore drift and wave action to sufficiently concentrate the heavy minerals.

6.2 *Local geology*

The tenement predominately consists of a thick sequence of silts, silty clays, clays and claystone that is interpreted as early Cretaceous shelf sediments of the Great Artesian Basin (Bull Dog Shale). The entire sequence is overlain by a broad silcrete horizon up to 10 – 15m thick.

7 EXPENDITURE

A total of \$64,742 has been spent on the tenement (Table 2) since it was granted in March 2008.

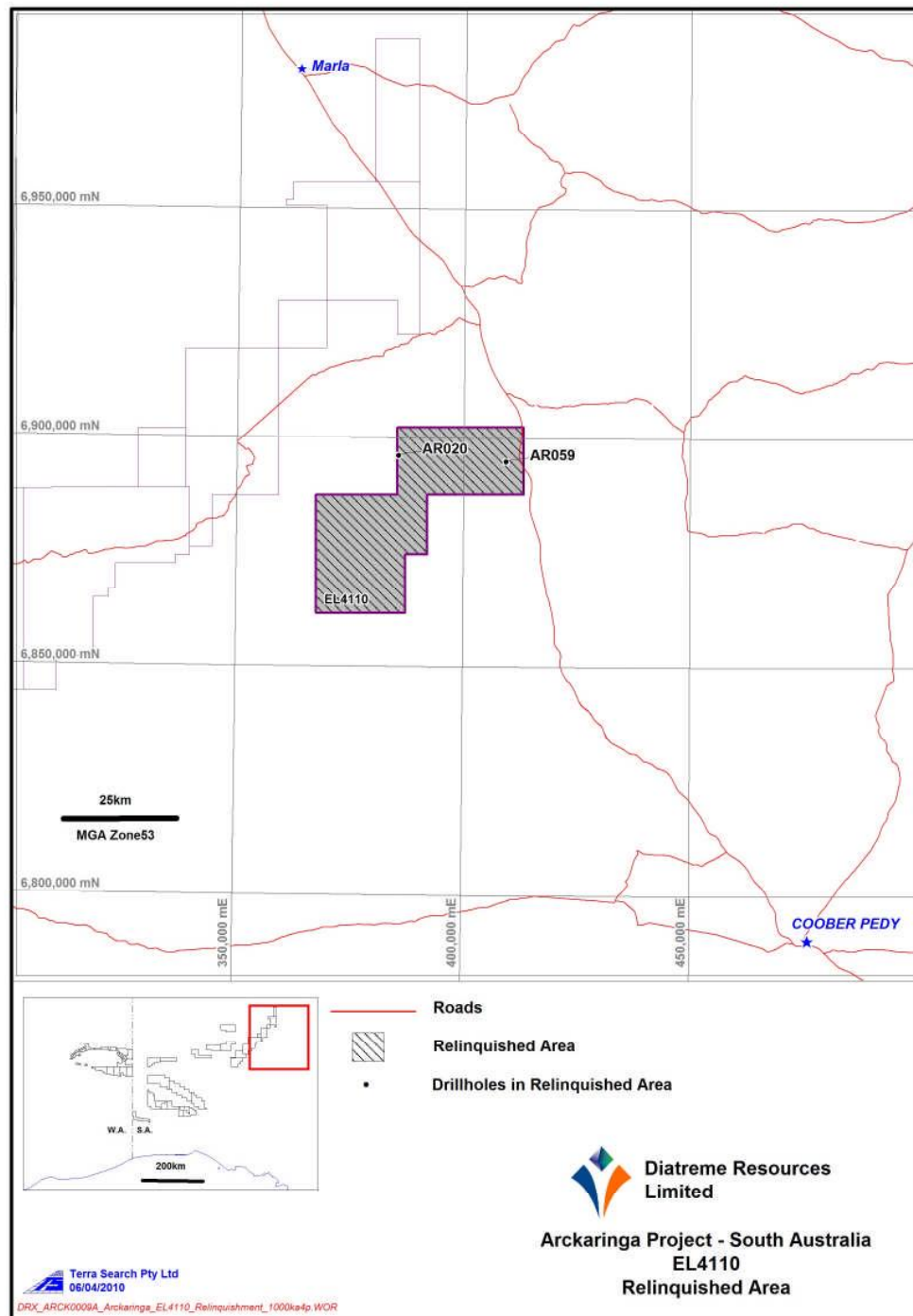
Table 2: EL4110 Tenement Expenditure (total)

EXPENSE	EL4110
Administration	5,328
Capital/Field Equipment	
Communications	221
Culture/Heritage	3,450
Database/GIS	623
Drilling	2,021
Earthmoving/Infrastructure/Engineering	
Field/Food/Camp	1545
Freight/Transport	
Fuel Drilling	517
Fuel Vehicles	380
Laboratory	137
Personnel	25,504
Tenement Management	16,797
Travel/Accommodation/Vehicles/Food	3,730
Vehicle Hire	4,488
Totals	\$64,742

8 CONCLUSION

No signs of heavy mineral sands were located during the exploration drilling and the western aspect of the tenement has access difficulties due to the Tallaringa Conservation Park and Woomera Prohibited Area. Therefore the entire tenement (Figure 4) has been surrendered.

Figure 4 – EL4110 Area of Relinquishment





DIATREME RESOURCES LIMITED

EL4111

Final Report
26/03/2008 – 2/04/2010

Arckaringa Basin Project

Author: David Jelley, April 2010

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SUMMARY

Diatreme Resources Limited (Diatreme) has completed one drilling programme over EL4111 since it was granted in 2008. During the first twelve months of the licence, extensive efforts were directed towards gaining access to Native Title Lands. Following successful completion of negotiating access and cultural heritage surveys, air core drilling commenced during October 2009. A total of seven holes over 458 metres were drilled during the exploration programme.

It was believed this tenement could be prospective for mineral sands although no prior exploration has been directed towards this commodity previously in this area. Petroleum companies have explored the area for oil and coal.

Diatreme has used interpreted digital elevation model (DEM) data to determine regional targets outside known depositional basins to define potential concentrations of heavy mineral sands. A program of stratigraphic drilling was completed along existing station tracks but only located minor heavy mineral sands from an offshore environment. However, the majority of the drill holes failed to locate any signs of mineralisation or favourable stratigraphy. As a result the tenement has been relinquished entirely.

KEYWORDS: South Australia, Arckaringa Basin, EL4111, Arckaringa Project, Heavy Mineral Sands, Diatreme Resources Limited, Air core drilling.

1 INTRODUCTION AND HISTORY

Diatreme's Arckaringa Basin Project is situated in the central part of South Australia, centred approximately 160km northwest of Coober Pedy.

Diatreme believes the coast line of the Proto Eucla Basin stretched further inland to the tenement areas and it is hoped this coast line, if present, is rich in heavy mineral sands.

Previous and current explorers have concentrated their efforts towards exploring for oil and coal and very little is known about the shallow geology or its prospectively for heavy mineral sands.

Diatreme conducted only limited drilling over EL4111 (Figure 2) but failed to locate prospective stratigraphy and only minor mineralisation. As a result the entire tenement has been relinquished (Figure 4).

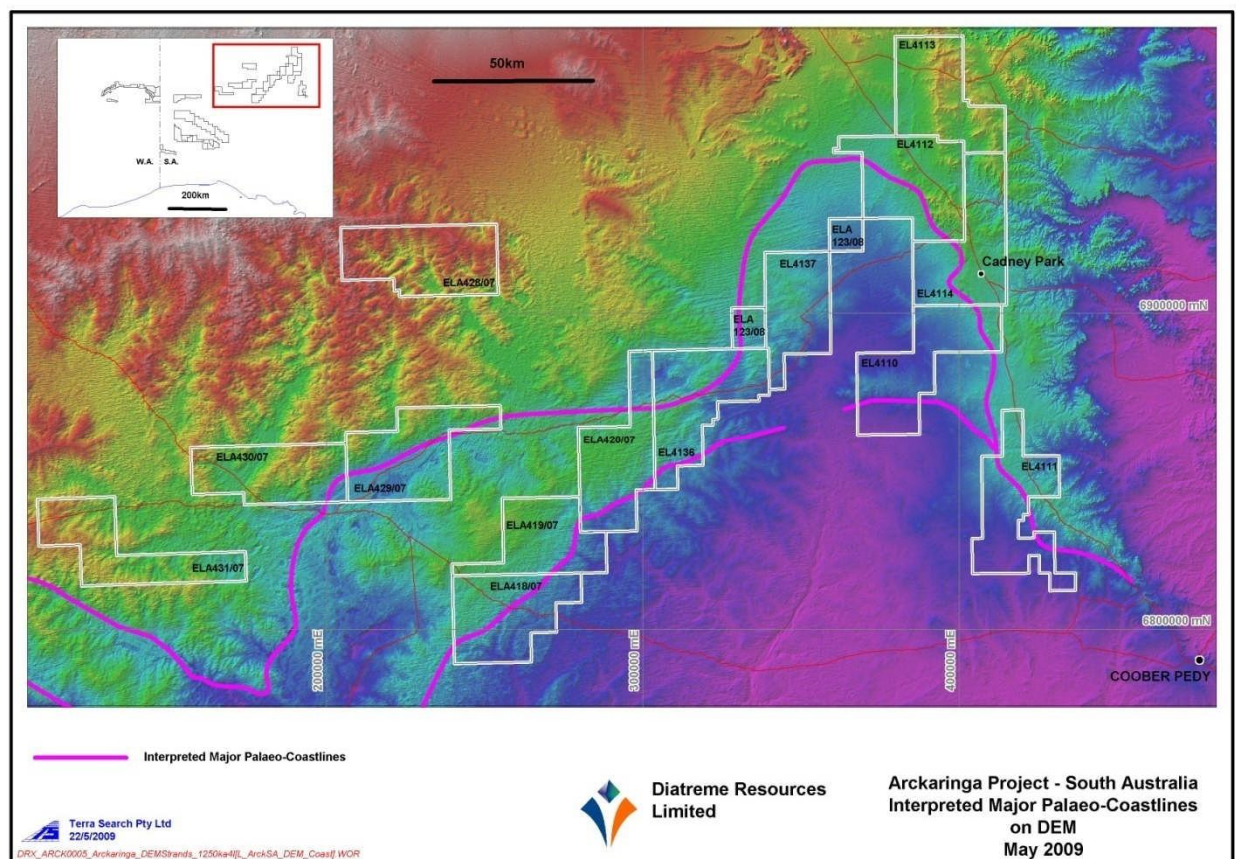


Figure 1: Arckaringa Basin Project tenements over DEM, South Australia.

2 LOCATION AND ACCESS

Access to the tenement is via the Stuart Highway from either Coober Pedy in the south or Marla in the north. Figure 1 and Figure 2 show EL4111 mostly lies to the west of the highway straddling the highway in the north of the tenement.

Cadney Park homestead (road house) is situated approximately 45km to the north of the tenement.

Station tracks served as access for drilling and no new roads were constructed.

The western portion of the tenement lies within the Woomera Prohibited Area which has access restrictions.

3 TENEMENT DETAILS

EL4111 was granted to Diatreme Resources Limited for a period of twelve months as set out in table 1 below. This tenement lies within the Arckaringa Project Area with a number of other Diatreme tenements and combined reporting for the project was granted to Diatreme on the 24th April 2009 with a reporting date to 25th March.

Table 1. EL4111 Tenement Information.

Project	Tenement Name	Application Number	Exploration Licence Number	Area (km ²)	Grant Date	Expiry Date	Expenditure Commitment PA
Arckaringa Basin							
	Mabel Creek	2007/424	EL4111	902	26/03/08	25/03/10	\$115,000

4 PREVIOUS EXPLORATION WITHIN THE REGION

4.1 Other Companies

Most of exploration to date in the Arckaringa Basin Project area has focused on coal, gas and petroleum and some engineering works.

Commonwealth Railways Geotechnical Drilling

Commonwealth Railways conducted a small geotechnical drilling programme in the early 1970's for the construction of the Tarcoola-Alice Springs Railway. This programme was in the northern part of EL4111. The holes were no deeper than 60m and their focus was on the strength of the rocks. There is a report on SARIG, ref RB 75/00048.

Coal Drilling by BP and Santos, mid 1970's

In the mid 1970's BP and Santos conducted separate drilling programmes in tenements to the west of EL4111.

BP drilled several lines of shallow holes (up to 120m) to the south and west of the tenements currently held by Diatreme. They found poor quality (high sulphur, moderate ash and non swelling) sub-metre thick coal seams at depths about 50m.

Santos drilled four 100m holes near BP's and did not encounter any coal at all.

In both cases the holes were fairly shallow, and were not of sufficient depth to intersect the seams that have subsequently been discovered.

Coal drilling by Meekatharra Minerals Ltd, 1980's

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Drill holes MC163 & 164 and MR165-168 (drilled in 1982), also contain coal somewhere in the vicinity of 150-170m. These holes are of particular interest as they are at the site of a proposed coal mine. They are located between EL's 4110 and 4111, at Westfield, longitude 134.09, latitude -28.22. Altona Resources, the owners of the current tenement, are conducting a drilling programme, looking at converting coal to petrol and building a power station.

Comalco Drilling Programmes

In and around the Diatreme tenements there are several holes drilled by Comalco in the 1980's. The MANYA, LAMBINA, MARLA, NICHOLSON, GILES, EMU and MUNAROO series have been drilled to a depth close to 2km, targeting petroleum. Information for this programme is in envelopes 3938, 4073 and 6259. One envelope

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In 1982 Comalco also conducted a drilling programme targeting coal in the Arckaringa Basin. They found seams in the Mt Toondina Formation. In the tenement 695, approximately 35km to the east of EL4114, some of the seams are up to several metres thick. These seams are quite variable in thickness and quality and are at depths greater than 150m, with the thickest and highest quality being those at the top. In their tenements 1069 and 1072-3, partially overlaying EL's 4114 and 4110, Comalco found coal to be shallowest and thickest in the east and becoming deeper and thinner to the west, with no intersection with coal in their easternmost and northernmost holes.

These holes were sampled and analysed for inherent moisture, per cent ash, volatiles and fixed carbon. It was found to have ash between 3 and 10%, with an average about 7%. A few samples were analysed for specific energy and were found to be fairly high, with an average around 20 MJ/Kg. Two samples were analysed for Sulphur, and although they were very low (0.3 and 0.6%) this cannot be used to indicate Sulphur levels for the whole area. Refer to *Technical Report of the 1982 Drilling Programme, EL695* and *Lithological Report Arckaringa Basin Coal* in envelope 6259.

Seismic Surveys, Gravity and Magnetism – Comalco

In the 1980's, Comalco conducted a geophysical programme to compliment its drilling programme. They conducted seismic surveys across much of tenements EL's 4110-4114. There is no mention of coal in the seismic survey report, although the area where coal has been discovered was not surveyed. There is discussion about the presence of loose sand and sandstone in the top 70m or so causing problems with the survey, which could be promising for the mineral sands project.

Comalco also did magnetic and gravity surveys. They discovered a magnetic anomaly to the east of EL4113 in the expired tenements of EL1070 and EL1071 although this was not followed up with drilling.

Currently, no heavy mineral sands exploration has been conducted in the Arckaringa Basin.

5 EXPLORATION BY DIATREME RESOURCES

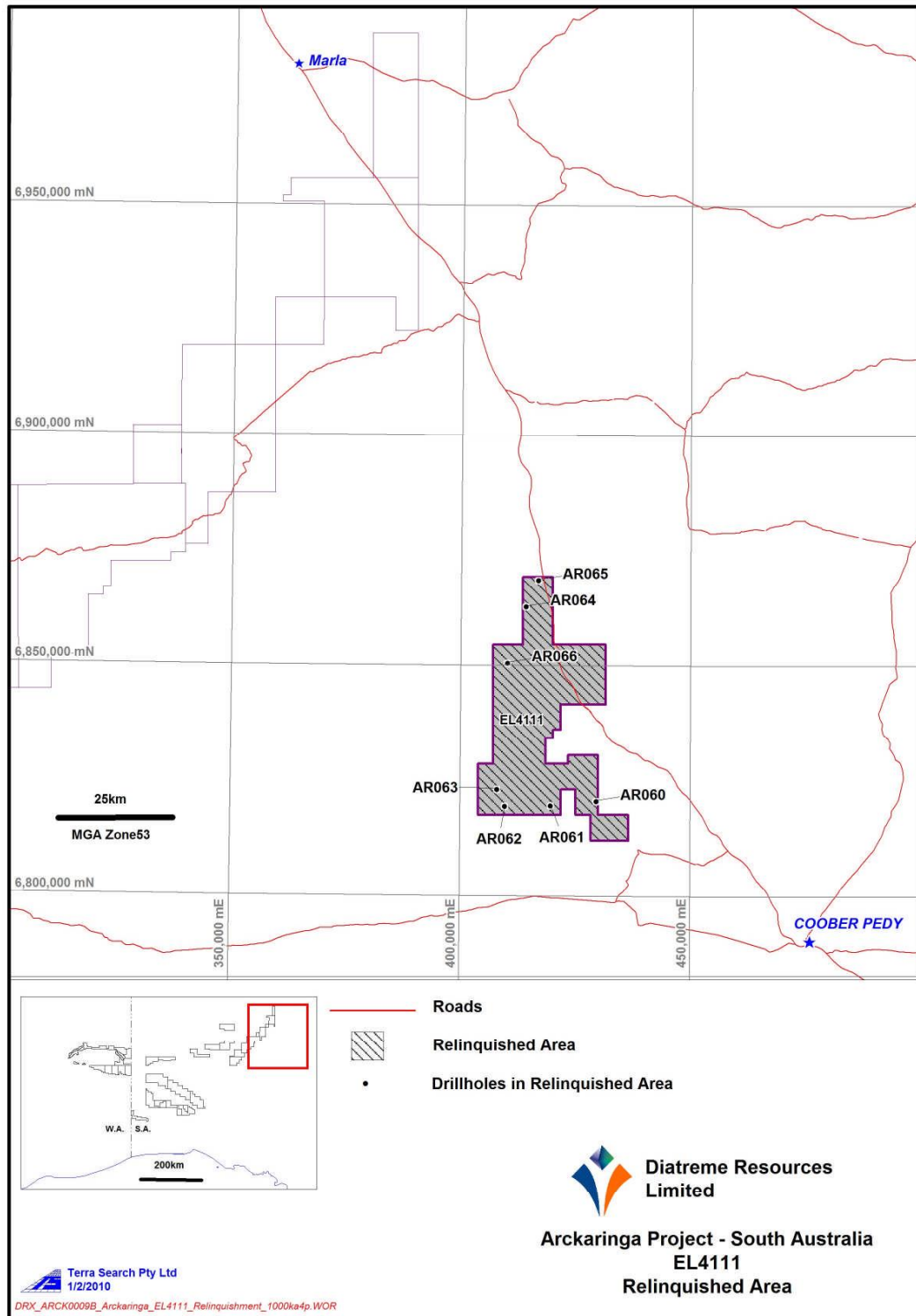
Diatreme has only conducted limited exploration over EL4111 since it was granted in early 2008. Exploration is summarised below.

Year 1: Exploration on ground could not be undertaken during the first year of the tenement due to difficulties in gaining access to the ground despite exhaustive efforts in 2008 and early 2009. Previous exploration reports and data were reviewed in preparation for drilling.

Year 2: A cultural heritage survey was carried out in April 2009 over all proposed drilling lines. An EWA reflecting the outcomes of discussions with various parties concerning environmental and native title/cultural heritage issues, was approved by PIRSA and exploration drilling was carried out over EL4111 between the 5th and 9th November, 2009. Air core drill holes were drilled along existing tracks utilising a company owned drill rig. A total of 458 metres drilled within seven drill holes were completed on EL4111 during this programme. Holes were between 54m and 83m deep. Only minor heavy mineral were located during this programme within drill hole AR062 but only low in grade, deep and interpreted to be from an offshore environment. Holes were approximately 10km apart.

The expenditure during the two year the tenement was active is listed in Table 2 below. The majority of this expenditure is related to traversing the ground to find access routes for drilling, cultural heritage surveys and aircore drilling.

Figure 2: Drilling within EL4111, Arckaringa Project, South Australia.



6. GEOLOGY

6.1 Regional geology

The Arckaringa Basin is a Permo-Carboniferous intracratonic basin which covers an area of approximately 80,000km². Mostly restricted to the subsurface it comprises a central platform of gently undulating shallow crystalline basement surrounded by troughs. Permian sediments are thin or absent over the central platform. The two major depocentres are the Boorthanna and Phillipson Troughs developed principally along northwest trends. They contain up to 1,300m of Permo-Carboniferous sediments and are underlain unconformably by up to 880m or more of ?Devonian, early Palaeozoic and Precambrian sediments and metasediments. Permian sediments are overlain by up to 300m of Late Jurassic to Early Cretaceous Eromanga Basin and generally less than 10m of Tertiary cover.

Initiation of the Boorthanna Trough may be related to extension of the Adelaide Geosyncline. Faulting is thought to have been synchronous with deposition. Seismic and palynological data indicate thinning over structural crests and local intra-Permian uplift and erosion.

Deposition commenced following widespread glaciation and a marine transgression, probably from the south. Termination of marine sediments was brought about by crustal isostatic recovery or eustatic fall bringing about a return to freshwater conditions with development of coal swamps. Sedimentation ceased as a consequence of positive epeirogenic movement at the end of the Early Permian.

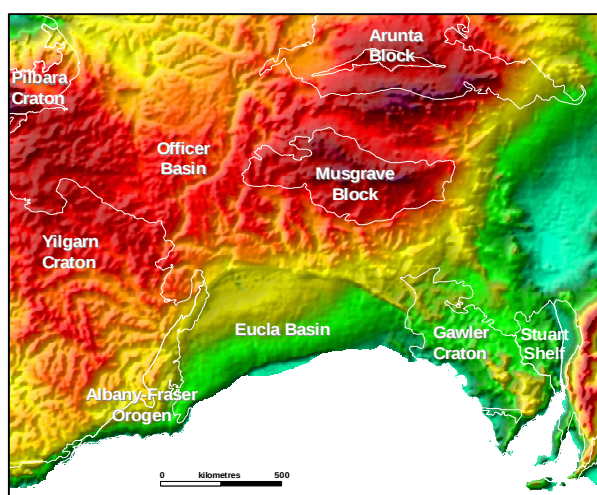


Figure 3. A Digital Elevation Model identifying major palaeoriver systems that enabled sediment transportation into the Eucla and Arckaringa Basins from the surrounding Archean/Proterozoic cratons.

Gravity and Magnetics – PIRSA

There is a high gravity anomaly in a NE-SW direction, mostly within tenements 2007/418-25. There is also a magnetic high to the north of the gravity anomaly, most of which is within the tenement 252/97, not owned by Diatreme. Smaller anomalies exist along the front of ELs 4110-4113. It seems likely that the large gravity anomaly and the smaller magnetic anomalies are associated with the edge of the Arckaringa Basin. In 1982, Comalco commissioned a report (Interpretation of Regional Gravity

Data, NE Officer Basin) which concluded that the gravity high was possibly due to a thinning of the crust and mafic intrusions caused by an intra continental rift.

Very little is actually known about the cover over the Arckaringa Basin, which will be the subject of exploration for heavy mineral sands. It is assumed by Diatrema that the proto Eucla Basin may have extended into the tenement package before the Eocene. There are a number of palaeorivers evident from the DEM shown in Figure 3, that drain the Musgrave Block which would have provided significant quantities of heavy minerals and if the sea did encroach this far inland, there would have been a concentrating mechanism with longshore drift and wave action to sufficiently concentrate the heavy minerals.

6.2 Local geology

The tenement predominately consists of a thick sequence (up to 120m thick) of early Cretaceous silts, silty clays, clays and claystone that is interpreted as shelf sediments of the Great Artesian Basin (Bull Dog Shale) with thin lenses of transgressive shoreface sediments occurring at significant depth (AR062 - 57m) that may contain minor concentrations of heavy minerals.

The entire sequence is overlain by a broad silcrete horizon up to 10 – 15m thick.

7 EXPENDITURE

A total of \$69,997 has been spent on the tenement (Table 2) since it was granted in March 2008

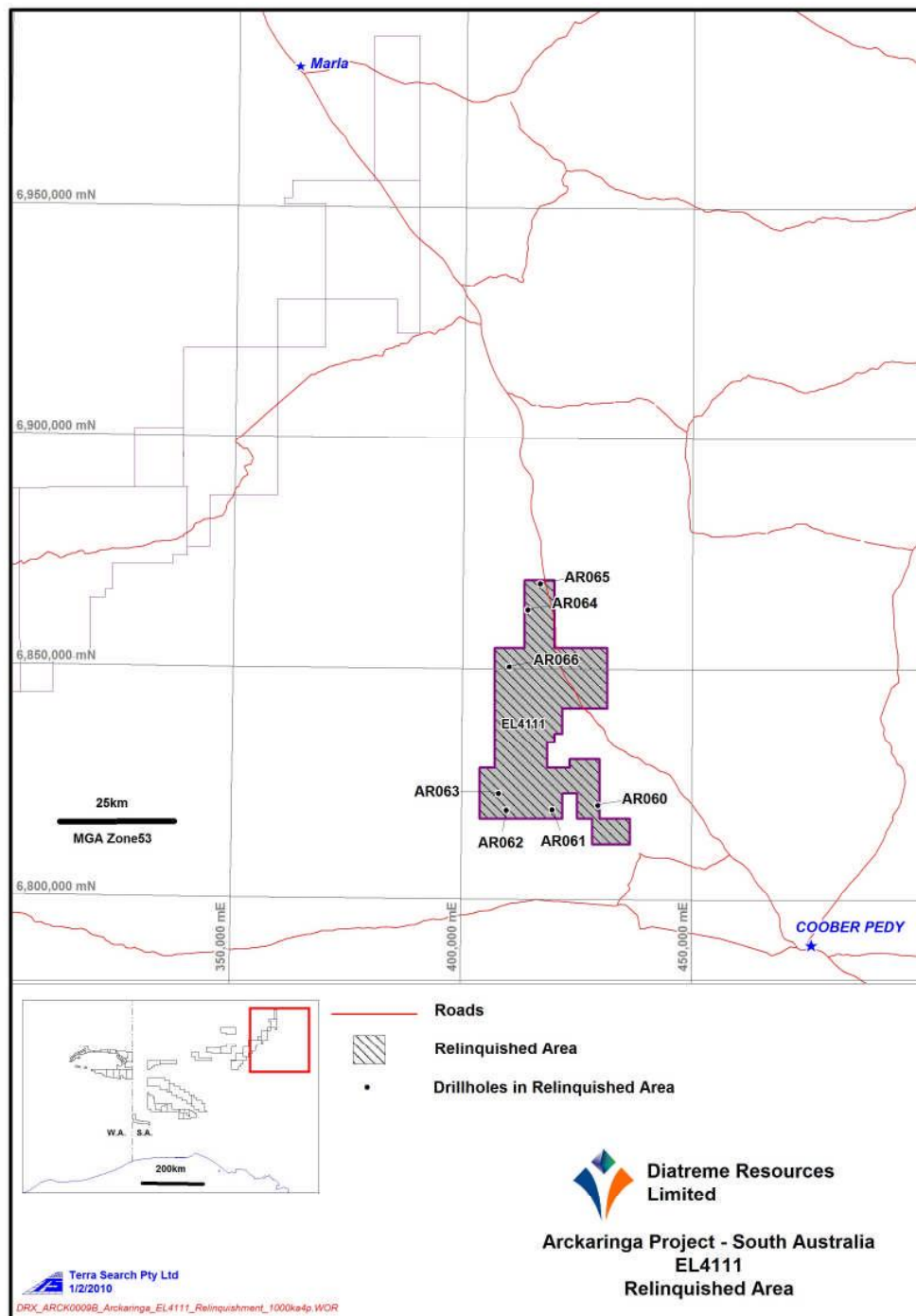
Table 2: EL4111 Tenement Expenditure (total)

EXPENSE	EL4111
Administration	6,291
Capital/Field Equipment	
Communications	221
Culture/Heritage	3,450
Database/GIS	623
Drilling	7,796
Earthmoving/Infrastructure/Engineering	
Field/Food/Camp	1,545
Freight/Transport	
Fuel Drilling	517
Fuel Vehicles	380
Laboratory	
Personnel	25,239
Travel/Accommodation/Vehicles/Food	3,730
Vehicle Hire	4,488
Tenement Management	15,715
Totals	\$69,997

8 CONCLUSION

Only minor heavy mineral sands were located during the exploration drilling interpreted to be from a transgressive offshore environment. However the majority of the holes failed to locate any signs of mineralisation or favourable stratigraphy. Therefore the entire tenement (Figure 4) has been surrendered.

Figure 4. EL4111 Areas of Relinquishment





DIATREME RESOURCES LIMITED

EL4114

Final Report
26/03/2008 – 2/04/2010

Arckaringa Basin Project

Author: David Jelley, April 2010

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SUMMARY

Diatreme Resources Limited (Diatreme) has completed one drilling programme over EL4114 since it was granted in 2008. During the first twelve months of the licence, extensive effort was directed towards gaining access to Native Title Lands. Following successful completion of negotiating access and cultural heritage surveys, air core drilling commenced in October 2009. A total of five holes over 479 metres were drilled during the exploration programme.

It was believed this tenement could be prospective for mineral sands although no prior exploration has been directed towards this commodity previously in this area. Petroleum companies have explored the area for oil and coal.

Diatreme has used interpreted digital elevation model (DEM) data to determine regional targets outside known depositional basins to define potential concentrations of heavy mineral sands. A program of stratigraphic drilling was completed along existing station tracks but failed to locate any signs of heavy mineral sands or favourable stratigraphic horizons for such. As a result the tenement has been relinquished entirely.

KEYWORDS: South Australia, Arckaringa Basin, EL4114, Arckaringa Project, Heavy Mineral Sands, Diatreme Resources Limited, Air core drilling.

1 INTRODUCTION AND HISTORY

Diatreme's Arckaringa Basin Project is situated in the central part of South Australia, centred approximately 160km northwest of Coober Pedy.

Diatreme believes the coast line of the Proto Eucla Basin stretched further inland to the tenement areas and it is hoped this coast line, if present, is rich in heavy mineral sands.

Previous and current explorers have concentrated their efforts towards exploring for oil and coal and very little is known about the shallow geology or its prospectivity for heavy mineral sands.

Diatreme conducted only limited drilling over EL4114 but failed to locate prospective stratigraphy or signs of mineralisation. As a result the entire tenement has been relinquished.

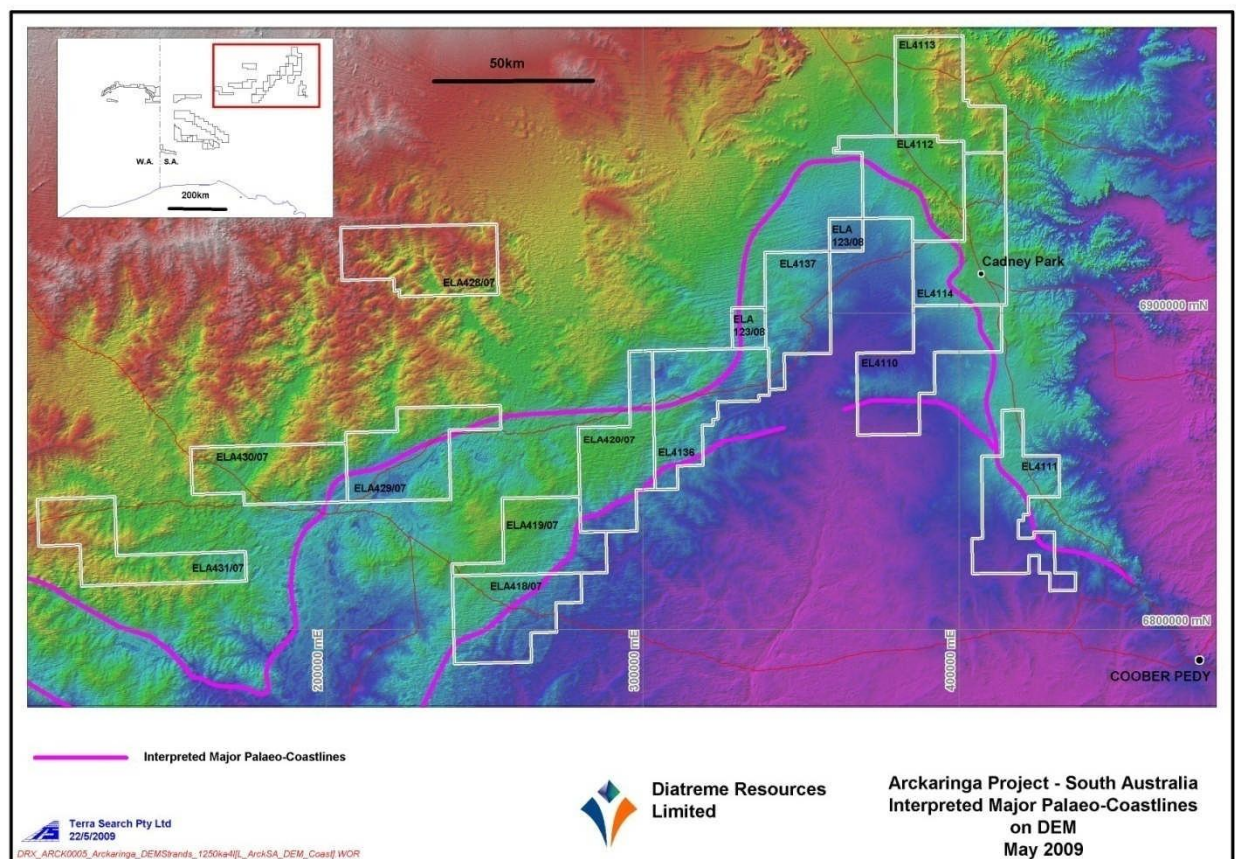


Figure 1: Arckaringa Basin Project tenements over DEM, South Australia.

2 LOCATION AND ACCESS

Access to the tenement is via the Stuart Highway from either Coober Pedy in the south or Marla in the north. Figure 1 & Figure 2 show EL4114 straddles the highway.

Cadney Park homestead (road house) is situated approximately in the southern area of the tenement.

The Mt Willoughby and Wintinna station tracks were used for access and served as the drilling traverses.

3 TENEMENT DETAILS

EL4114 was granted to Diatreme Resources Limited for a period of twelve months as set out in the table below. This tenement lies within the Arckaringa Project Area with a number of other Diatreme tenements and combined reporting for the project was granted to Diatreme on the 24th April 2009 with a reporting date to 25th March.

Table 1. EL4114 Tenement Information

Project	Tenement Name	Application Number	Exploration Licence Number	Area (km ²)	Grant Date	Expiry Date	Expenditure Commitment PA
Arckaringa Basin							
	Wintinna	2007/427	EL4114	959	26/03/08	25/03/10	\$125,000

4 PREVIOUS EXPLORATION WITHIN THE REGION

4.1 Other Companies

Most of exploration to date in the Arckaringa Basin Project area has focused on coal, gas and petroleum and some engineering works.

Commonwealth Railways Geotechnical Drilling

Commonwealth Railways conducted a small geotechnical drilling programme in the early 1970's for the construction of the Tarcoola-Alice Springs Railway. This programme was in the northern part of EL4114. The holes were no deeper than 60m and their focus was on the strength of the rocks. There is a report on SARIG, ref RB 75/00048.

Coal Drilling by BP and Santos, mid 1970's

In the mid 1970's BP and Santos conducted separate drilling programmes in tenements to the west of EL4111.

BP drilled several lines of shallow holes (up to 120m) to the south and west of the tenements currently held by Diatreme. They found poor quality (high sulphur, moderate ash and non swelling) sub-metre thick coal seams at depths about 50m.

Santos drilled four 100m holes near BP's and did not encounter any coal at all.

In both cases the holes were fairly shallow, and were not of sufficient depth to intersect the seams that have subsequently been discovered.

Coal drilling by Meekatharra Minerals Ltd, 1980's

Meekatharra Minerals conducted a drilling programme in the early 1980's overlapping the BP programme from the 1970's. These holes were drilled to a greater depth than those drilled by BP, up to 200m. Only basic stratigraphic logs are available from SARIG without precise details of depths and thicknesses of seams. Several holes intersected coal seams at about 170m, although there is no data available about the thickness, quality or precise depth. Only three holes were drilled inside tenements held by Diatreme and there are two on the boundary. The basic stratigraphic logs for holes MR107-110 do not mention coal; however, MC176 has a seam of shaley coal somewhere between depths of 152-177m.

Drill holes MC163 & 164 and MR165-168 (drilled in 1982), also contain coal somewhere in the vicinity of 150-170m. These holes are of particular interest as they are at the site of a proposed coal mine. They are located between EL's 4110 and 4111, at Westfield, longitude 134.09, latitude -28.22. Altona Resources, the owners of the current tenement, are conducting a drilling programme, looking at converting coal to petrol and building a power station.

Comalco Drilling Programmes

In and around the Diatreme tenements there are several holes drilled by Comalco in the 1980's. The MANYA, LAMBINA, MARLA, NICHOLSON, GILES, EMU and MUNAROO series have been drilled to a depth close to 2km, targeting petroleum. Information for this programme is in envelopes 3938, 4073 and 6259. One envelope

has been destroyed, envelope 5073. No coal seam is mentioned in the logs; however, there have been assays for copper, zinc and lead, with a significantly high anomaly in all holes in member 4 of the Observatory Hill Beds. There was also an irregular Copper pattern in the deeper Cadney Park Information. More information is in the report Base Metal Chemical Data from Eastern Officer Basin Drill Holes in envelope 3938 and in the individual borehole summaries.

These holes also have geophysical logs available, paper copies of which are stored in envelopes 6259 and 3938. There are also computer tapes; however, copies of these will have to be ordered from PIRSA.

There are several lines of fairly shallow holes that were drilled in the early 1980's to depths of up to 130m. These holes were drilled for explosive shots for their seismic programme. The chips were analysed for copper, zinc and lead and the results are in envelope 3938. There is a high anomaly of copper (up to 1000ppm, but most assays are lower than 200ppm) at about 70m in most holes, corresponding to the Observatory Hill Beds. These holes did not encounter any significant coal seams, although this may be due to the shallow depth of the holes.

In 1982 Comalco also conducted a drilling programme targeting coal in the Arckaringa Basin. They found seams in the Mt Toondina Formation. In the tenement 695, approximately 35km to the east of EL4114, some of the seams are up to several metres thick. These seams are quite variable in thickness and quality and are at depths greater than 150m, with the thickest and highest quality being those at the top. In their tenements 1069 and 1072-3, partially overlaying EL's 4114 and 4110, Comalco found coal to be shallowest and thickest in the east and becoming deeper and thinner to the west, with no intersection with coal in their easternmost and northernmost holes.

These holes were sampled and analysed for inherent moisture, per cent ash, volatiles and fixed carbon. It was found to have ash between 3 and 10%, with an average about 7%. A few samples were analysed for specific energy and were found to be fairly high, with an average around 20 MJ/Kg. Two samples were analysed for Sulphur, and although they were very low (0.3 and 0.6%) this cannot be used to indicate Sulphur levels for the whole area. Refer to *Technical Report of the 1982 Drilling Programme, EL695* and *Lithological Report Arckaringa Basin Coal* in envelope 6259.

Seismic Surveys, Gravity and Magnetism – Comalco

In the 1980's, Comalco conducted a geophysical programme to compliment its drilling programme. They conducted seismic surveys across much of tenements EL's 4110-4114. There is no mention of coal in the seismic survey report, although the area where coal has been discovered was not surveyed. There is discussion about the presence of loose sand and sandstone in the top 70m or so causing problems with the survey, which could be promising for the mineral sands project.

Comalco also did magnetic and gravity surveys. They discovered a magnetic anomaly to the east of EL4113 in the expired tenements of EL1070 and EL1071 although this was not followed up with drilling.

Currently, no heavy mineral sands exploration has been conducted in the Arckaringa Basin.

5 EXPLORATION BY DIATREME RESOURCES

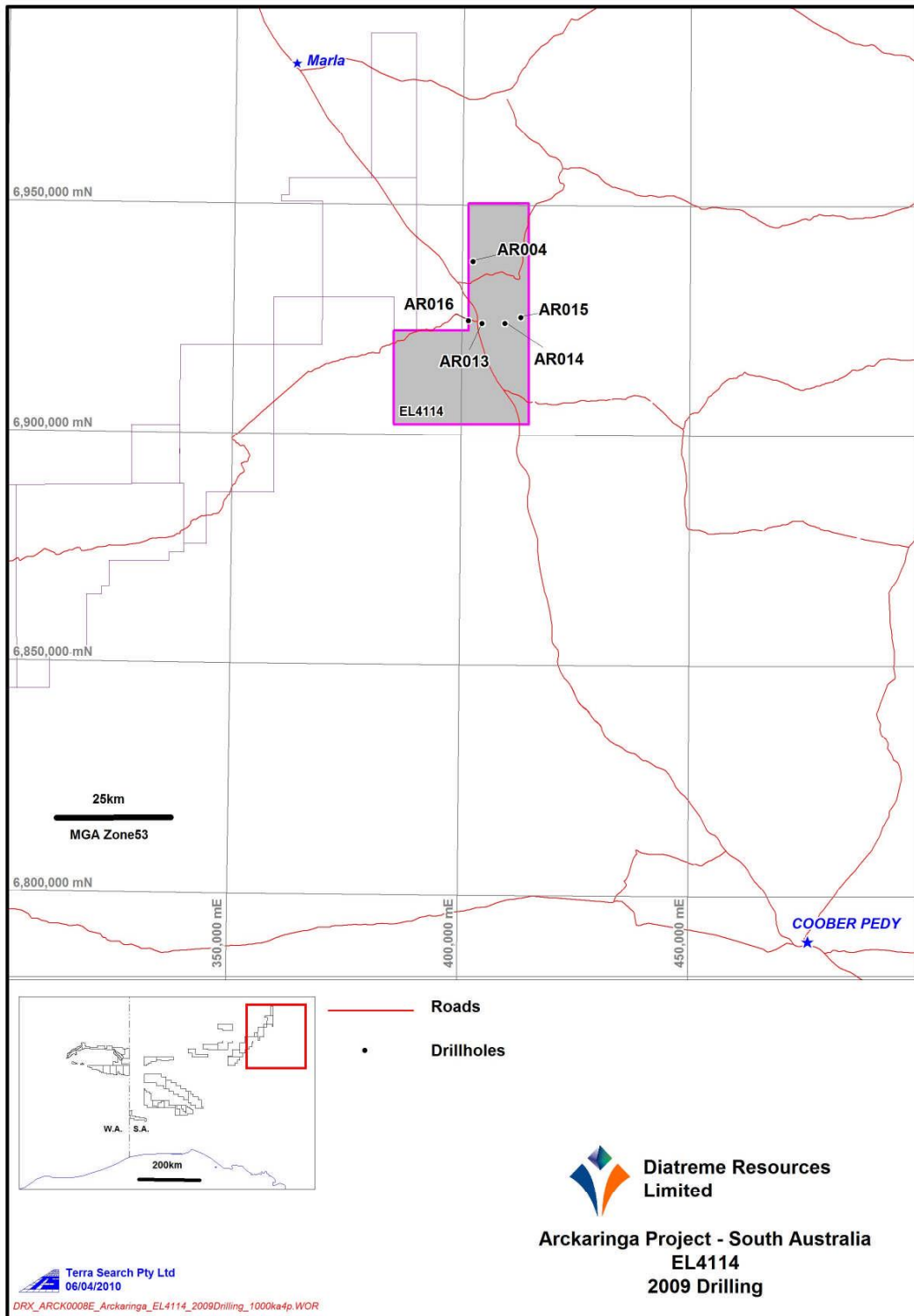
Diatreme has only conducted limited exploration over EL4114 since it was granted in early 2008. Exploration is summarised below.

Year 1: Exploration on ground could not be undertaken during the first year of the tenement due to difficulties in gaining access to the ground despite exhaustive efforts in 2008 and early 2009. Previous exploration reports and data were reviewed in preparation for drilling.

Year 2: A cultural heritage survey was carried out in April 2009 over all proposed drilling lines. An EWA reflecting the outcomes of discussions with various parties concerning environmental and native title/cultural heritage issues, was approved by PIRSA and exploration drilling was carried out over EL4114 along existing tracks on the 4th October 2009 and between 11th and 13th October 2009. A total of 479 metres drilled within five drill holes were completed on EL4114 during this programme through the utilisation of the company owned aircore drilling rig. Holes were between 87m and 115m deep and spaced many kilometres apart. No trace of mineralisation was located and the stratigraphy was deemed unprospective for heavy mineral sands.

The expenditure during the two year the tenement was active is listed in Table 2 below. The majority of this expenditure is related to traversing the ground to find access routes for drilling, cultural heritage surveys and aircore drilling.

Figure 2: Drilling within EL4114, Arckaringa Project, South Australia.



6. GEOLOGY

6.1 Regional geology

The Arckaringa Basin is a Permo-Carboniferous intracratonic basin which covers an area of approximately 80,000km². Mostly restricted to the subsurface it comprises a central platform of gently undulating shallow crystalline basement surrounded by troughs. Permian sediments are thin or absent over the central platform. The two major depocentres are the Boorthanna and Phillipson Troughs developed principally along northwest trends. They contain up to 1,300m of Permo-Carboniferous sediments and are underlain unconformably by up to 880m or more of ?Devonian, early Palaeozoic and Precambrian sediments and metasediments. Permian sediments are overlain by up to 300m of Late Jurassic to Early Cretaceous Eromanga Basin and generally less than 10m of Tertiary cover.

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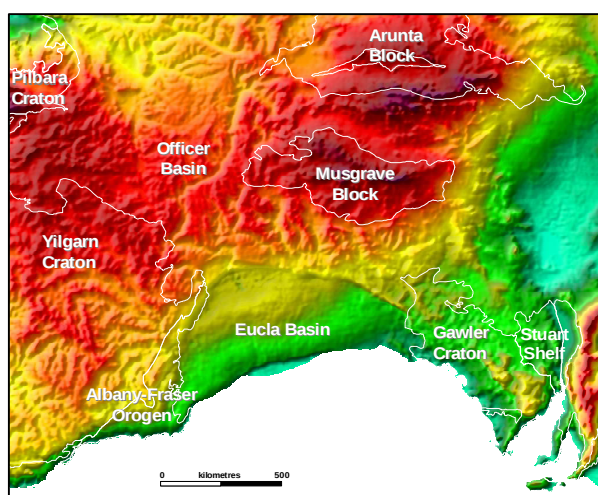


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7 EXPENDITURE

A total of \$70,412 has been spent on the tenement (Table 2) since it was granted in March 2008.

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Communications	222
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Freight/Transport	
Fuel Drilling	518
Fuel Vehicles	380
Laboratory	
Personnel	24,490
Tenement Management	16,516
Travel/Accommodation/Food	3,670
Vehicle Hire	4,487
Totals	\$70,412

8 CONCLUSION

No heavy minerals or suitable stratigraphic horizons were located during the exploration drilling therefore the entire tenement (Figure 4) has been surrendered.

Figure 4 EL4114 Areas of Relinquishment

