

# **Open File Envelope**

## **No. 12,232**

**EL 4631**

**PIDINGA**

### **ANNUAL REPORT AND FINAL REPORT TO LICENCE EXPIRY/SURRENDER, FOR THE PERIOD 13/12/2010 TO 12/12/2012**

Submitted by  
Southern Coal Holdings Pty Ltd  
2013

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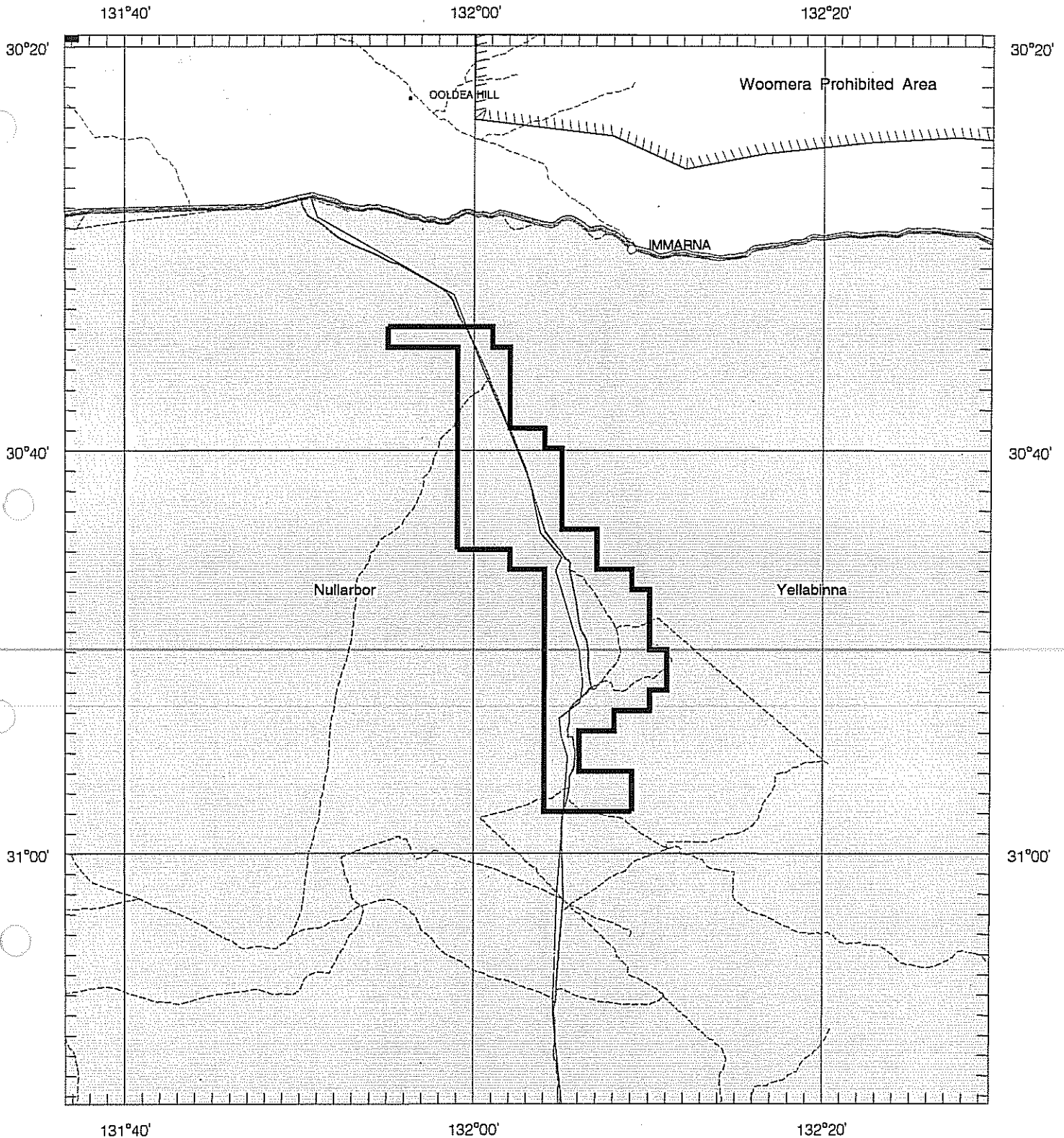
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**Government of South Australia**

Department for Manufacturing,  
Innovation, Trade, Resources and Energy

# SCHEDULE A



SCALE 1 : 500 000

KILOMETRES 10 0 10 20 30 40 50 KILOMETRES

LICENCE GRANTED IN : DATUM AGD66



APPLICANT : **SOUTHERN COAL HOLDINGS PTY LTD**

FILE REF : **63/10**

TYPE : **MINERAL ONLY**

AREA : **357 km<sup>2</sup> (approx.)**

1:250000 MAPSHEETS : **OOLDEA BARTON**

LOCALITY : **PIDINGA AREA - Approximately 210 km northwest of Ceduna**

DATE GRANTED : **13-Dec-2010**

DATE EXPIRED : **12-Dec-2012**

EL NO : **4631**



**Southern Coal Holdings Pty Ltd**

***Annual Report on Exploration Licence 4631***

***Pidinga***

***For the Period 13<sup>h</sup> December 2010 to 12<sup>th</sup> December 2011***

***by***

***Gary J. Jones***

***February 2012***

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## TENEMENT REPORT INDEX

TENEMENT:	EL 4631
TENEMENT HOLDER:	Southern Coal Holdings Pty Ltd
OPERATOR:	Southern Coal Holdings Pty Ltd
AUTHOR:	Gary J Jones
1:250,000 SHEETS:	Barton SH53-09
1:100,000 SHEETS:	Moondrah 5236 Pidinga 5336
MINERAL PROVINCE:	Eucla Basin, Gawler Craton
COMODITIES:	Coal, Lignite, Potash
KEY WORDS:	Lignite, potash, drilling

## ***Summary***

Exploration by SCH on EL 4631 Pidinga during the first year of the tenure has been focused on the previously known lignite deposits and more recently on the potash potential of alunite bearing clays in the vicinity of Lake Ifould

Previous exploration by several companies in this general locality during the 1970's and 1980's was primarily for uranium with lesser exploration effort directed towards the lignite and heavy mineral sands.

SCH has planned a modest program of slimline vertical aircore holes designed to follow up potash intersections made in SA Mines Department drilling as far back as 1948. The considerable documentation required in order to gain approvals for access to this sensitive area for exploration is well advanced and it is anticipated that the drilling will be carried out during the next six monthly reporting period.

Expenditure on EL 4631 for the year ended 12<sup>th</sup> December 2011 was \$32,888.00.

## **1. Introduction**

Southern Coal Holdings Pty Ltd ("SCH") is the operator for Exploration Licence 4631, Pidinga. The project area is centred approximately 200 kilometres north west of Ceduna, in the Eucla Basin and south western portion of the Gawler Craton. The licence covers an area of 357 square kilometres.

The project area was selected to in order to explore for coal and lignite deposits, in an area where several intersections of lignite had been made in drill holes by previous explorers.

SCH considers the Pidinga project area is prospective for coal and lignite deposits as well as near-surface potash deposits. Alunite bearing clays in the vicinity of Lake Pidinga contain significant levels of potash. Alunite is also a prominent alteration mineral associated with high sulphidation epithermal gold deposits.

## **2. Location and Access**

### **2.1 Location and Access**

The Pidinga project is situated in southern South Australia approximately 200 kilometres north west of Ceduna as shown in Figure 1. The project area comprises EL 4631 Pidinga and covers an area of approximately 357 square kilometres. The sealed Eyre Highway is approximately 65 kilometres to the south and the Transcontinental railway line is approximately 20 kilometres to the north. Access to the project area is via the Eyre Highway, thence the Illuka Jacinth-Ambrosia haul road and then along existing tracks. The area is covered by the 1:250,000 Map Sheet Barton SH-5-09 and 1:100,000 map sheets Moondrah 5236 and Pidinga 5336.

### **2.2 Physiography and Land Use**

The topography of the project area is largely flat to undulating and ranges in altitude from around 148m asl in the south-east to 107m asl in the north. There is no permanent surface water in the area however ephemeral creeks drain into numerous small to medium sized salt lakes the most notable being lakes Pidinga and Ifould.

The Pidinga project area is located predominantly within the Yellabinna subregion of the Great Victoria Desert IBRA bioregion, but is also at the boundary of the Yalata and Nullarbor Plain subregions. The Yellabinna subregion supports a series of parallel sand dunes, while the Yalata sub-region to the south of the Pidinga area consists of aeolian sand dunes. The south-east extension of the dune fields of the Great Victorian Desert (GVD) flank the flat plain of the Nullarbor and includes the Ooldea Range, which lies to the east of the Pidinga project and trends north-west to south-west. The Ooldea Range is comprised of a series of linear, longitudinal dunes formed from an ancient shoreline that are constructed largely of quartz sand.

The main land use of the area is conservation and Aboriginal land use, as well as mineral exploration, and limited tourism. The lack of access, water and general isolation of areas within the Yellabinna Regional Reserve, such as the Pidinga area, has contributed to the lack of visitation and pastoral development within the area.



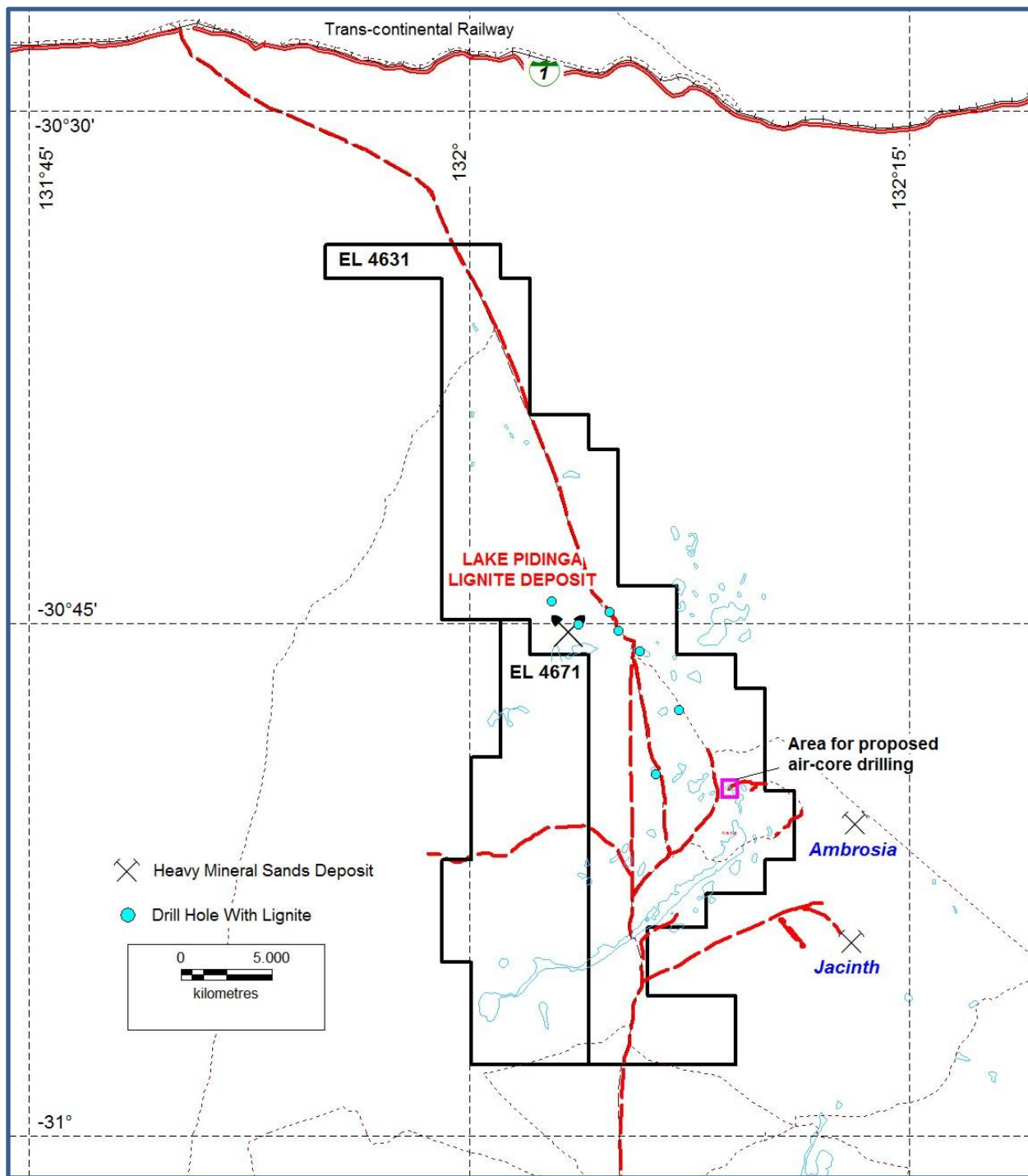


Figure 1. EL 4631 Pidinga Locality Diagram.

## 2.3 Climate

The Pidinga area has a mediterranean type climate with hot, dry summers and cool, wet winters. July is the wettest month. The average yearly precipitation is just under 300mm at the coast and diminishes northward into the interior, becoming increasingly semi-arid. The Goyder's Line, which demarcates the edge of the area where rainfall is generally sufficient to support agriculture, starts near Ceduna.

## 3. Tenure

### 3.1 Tenement Details

Exploration Licence 4631 covers an area of 357 square kilometres. The tenement lies wholly within the boundaries of the Yellabinna Regional Reserve. EL 4631 was granted to Southern Coal Holdings Pty Ltd a wholly owned subsidiary of WPG Resources Ltd ("WPG") on the 13<sup>h</sup> of December 2010 and is current to 12<sup>th</sup> of December 2012.

### 3.2 Landowners

EL 4631 lies within the area covered by the Alinytjara Wilurara Natural Resources Management (NRM) Board, which covers 26% of the State. The area is within the Great Victorian Desert Environmental Region, and the Yellabinna Environmental Association

Throughout the region, there is a high degree of cultural connection to Aboriginal Lands and traditional ownership is recognised. The Far West Coastal Group, representing the Mirning, Wirangu, Maralinga Tjarutja, Yalata and Yabi Dinah groups, are the native title claimants within the project area. The Claim is registered with the National Native Title Tribunal. In particular, formal Aboriginal Lands closest to the project area includes the Yalata Lands (approximately 4600 km<sup>2</sup>) and the Maralinga Lands (approximately 100 000 km<sup>2</sup>). Several Aboriginal communities exist within these Aboriginal Lands and utilise the Yalata and Maralinga Lands.

The Yalata Aboriginal Lands are protected under the *Aboriginal Lands Trust Act 1966*, which vests inalienable freehold title in the Aboriginal Lands Trusts (ALT) and makes the ALT the 'landowner'. It is ALT policy to lease the land it owns to the appropriate Aboriginal community and family organisations and the Yalata Lands are leased back to the Yalata community at the local level. The ALT Board includes representatives from the various Aboriginal communities located on ALT Lands. The Yalata community township now comprises about 160 people.

The Maralinga Tjarutja Aboriginal Lands (MT Lands) lie further north of the Yalata Lands. *Maralinga Tjarutja Land Rights Act 1984* vests the land in MT under inalienable freehold title. The members of Maralinga Tjarutja Council are elected members from the community. The population of the MT Lands consists of about 100 people in 20 families, including staff based at the Oak Valley community. Oak Valley is now the population centre of the MT Lands and the number of people in the community rises significantly during cultural activities. There is regular movement of people between Ceduna, Yalata, Oak Valley, and other communities in the Region

### **3.3 Aboriginal Heritage Clearance**

Native Title Mining Agreements for Exploration with the variously affected Native Title Claimant Groups are currently in the process of being negotiated. A work clearance will be carried out at the Pidinga prospect prior to the commencement of the planned program of air-core drilling.

## **4. Regional Geology**

The Pidinga project area is located on the eastern margin of the Eucla Basin. The Eucla Basin extends from Balladonia in Western Australia to east of Ooldea in South Australia.

Paleoproterozoic basement rocks comprise banded acid, intermediate and basic gneiss and schist and some granite all cut by pegmatite and quartz veins and are correlated with the Cleve Metamorphic suite of the Lincoln Complex. Outcrops are present along the north-western shore of Lake Ifould and occasionally within the lake bed itself.

The basement rocks are overlain by the Eocene Pidinga Formation sediments which includes sand, minor shales, lignitic clays and clayey lignites. The formation was deposited in a non-marine environment with the exception of the uppermost units that show evidence of the onset of a major mid-Eocene marine transgression. A sandy unit at the top of the Pidinga Formation may be Hampton Sandstone identified in previous drill holes and elsewhere in the Eucla Basin.

The Nullabor Limestone of Miocene age unconformably overlies the Pidinga Formation and wedges out against the Precambrian basement approximately 15 kilometres to the north east and east of Chundie Swamp. This is a hard crystalline fossiliferous limestone that forms a cap over the underlying sediments. The top of the Nullabor Limestone marks the end of Tertiary marine deposition period..

A thin veneer of Quaternary sediments that comprise alluvium, sand dunes, sandy and calcareous soil and lake deposits blankets the eastern side of the Eucla Basin. A regional geological map is shown in Figure 2.

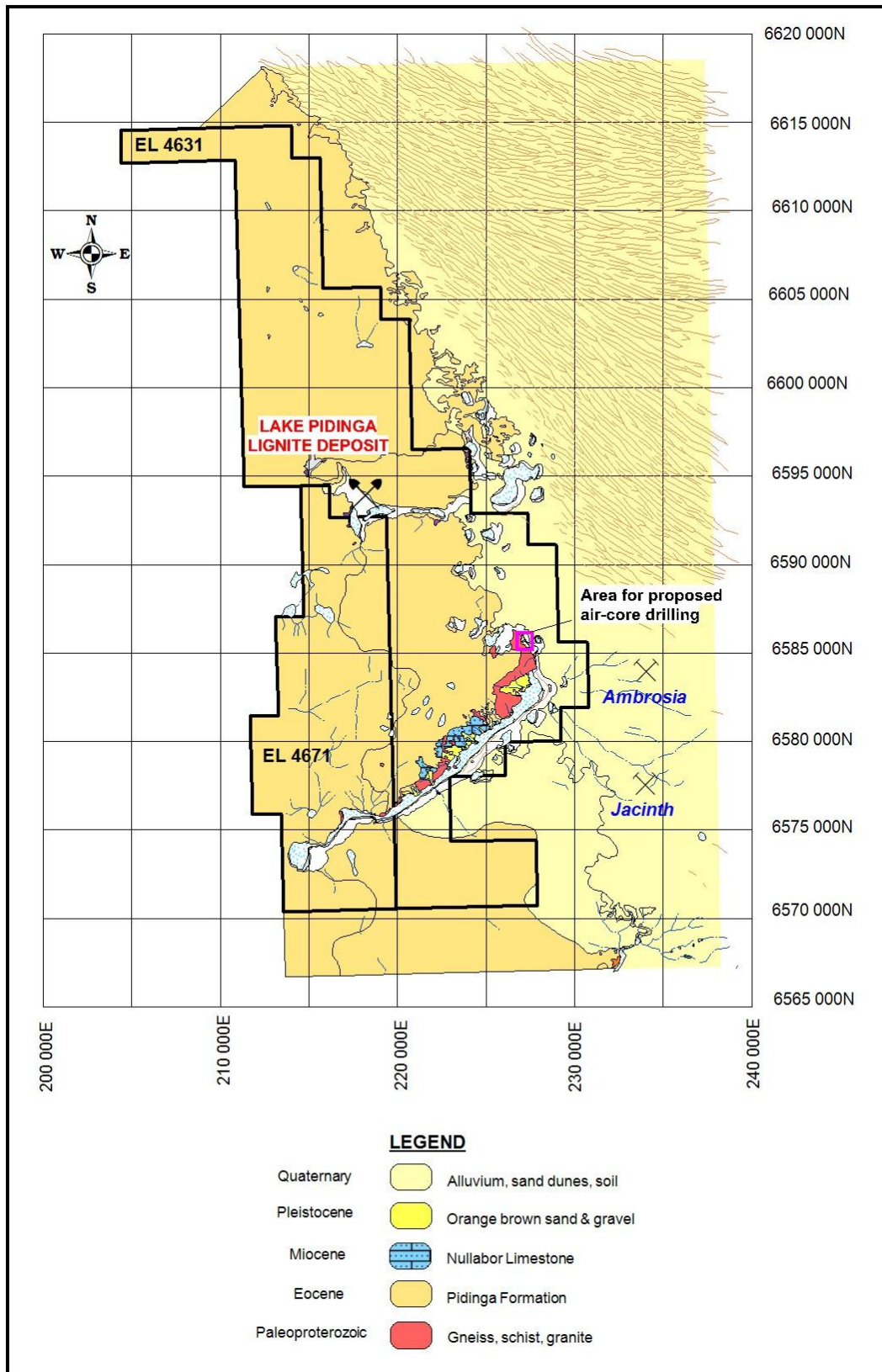


Figure 2. Pidinga EL 4631 Regional Geology

## **5. Work Completed**

### **5.1 Literature Review**

During the six month reporting period Southern Coal Holdings Pty Ltd (SCH) completed a full and detailed literature review and assessment of all the previous exploration including the drilling of 129 holes within the area covered by the current tenement. Results of this study have shown that although intersections of lignite were made in 57 of these holes the potential for a significant deposit of lignite is limited. Results of the literature review are summarised below.

#### **Env 00869 Mines Administration Pty Ltd. 1968**

A drilling program of eight holes aggregating 284 feet (86.6 metres) was carried out to determine the quantity and composition of the brines in the Talacootra - Pidinga lake systems with particular reference to the occurrence of potash or other valuable dissolved salts. The drilling indicated that the most extensive deposits of alunitic clay occurred in Lake C and that water bearing lake sediments were confined to Lake C and a narrow strip of the Main Lake. The total volume of brine present was therefore considered to be very limited.

#### **Env 01200 Australasian Mining Corp. Ltd. 1970**

Preliminary field reconnaissance in the Pidinga Lake – Lake Talacootra – Red Lake – Seven Mile Swamps area revealed significantly high radioactivity that was found to be restricted to minor discontinuous outcrops and minor near surface sample intervals in auger holes drilled in saline lagoons. Follow up work comprised a series of ground and airborne traverses with a hand held scintillometer and later a more comprehensive airborne radiometric survey. Anomalies were tested with a total of 97 holes for an aggregate 11,392 feet (3,742 metres). Minor low grade uranium mineralisation was located in basal conglomerates and in some lignite intervals. Alunitic clay was logged from eleven of the drill holes.

#### **Env 01316 Australasian Mining Corp. Ltd. 1970**

Exploration was carried out in conjunction with that reported in Env01200. Highest radioactivity was recorded from lignite beds north and west of Pidinga Lake. Thirty six holes for 3,649 feet (1,112 metres) were drilled in the lease area.

#### **Env 02169 Pechiney (Australia) Exploration Pty. Ltd. 1974**

EL 10. Airborne radiometric survey and rotary drilling in 43 holes for 1,677.9 metres testing radiometric anomalies. No results were reported.

#### **Env 02170 Pechiney (Australia) Exploration Pty. Ltd. 1974**

Exploration on EL 9 was carried out in conjunction with that on EL 10 and reported in Env02169. Rotary drilling in 29 holes for 1,432.4 metres testing radiometric anomalies. No results were reported.

**Env 02435     Pechiney (Australia) Exploration Pty. Ltd.     1974**

Final report for part of the area explored in EL 10 that was to be relinquished. Pechiney concluded that the uranium prospects on EL 10 appeared to be poor. Drilling had established the presence of weak radioactivity connected with clayey lignitic facies of the Pidinga Formation. The lignites were considered to have a limited lateral development and therefore it appeared unlikely that economic uranium concentrations would occur.

**Env 02504     Pechiney (Australia) Exploration Pty. Ltd.     1975 - 1976**

EL 164 covered the reduced part of EL 10. Exploration comprised track etch surveys, ground geological investigation of radiometric anomalies, soil rock and water sampling. Drilling comprised 10 holes for a total of 311 metres and all holes were down hole scintillometer probe logged. Neither drilling nor track etch surveys gave encouraging results and the radiometric anomalies were attributed to radium and/or radon in the ground waters or to concentrations of uranium daughter products in the evaporates on the surface of the salt lakes.

**Env 03105     South Australia Department of Mines & Energy (SADME).     1977**

EL 281. Lignite and brown coal exploration that was carried out by SADME. Five holes were drilled at Pidinga but only two intersected lignitic sediments. The thickest seam was in Pidinga No.1 but samples recorded high ash contents that ranged from 55% to 75% on a dry basis. Overall it was concluded that the lignite occurred in small lenses and that reserves would be negligible. Added to that was the detraction of high ash content.

**Env 03829     Minoil Services Pty. Ltd.     1980**

EL 601. This tenement was taken up to investigate the potential of the known lignitic sediments as a carbon source for the liquefaction and/or carbon beneficiation process and covered the Pidinga lignite deposit. One hole was completed to a depth of 62.79 metres early in the life of the tenure and 14 further holes were later precollared but not deepened. Five of the pre-collar holes reached basement at shallow depths without intersecting lignitic material indicating the occurrence of lignitic sediments was not as widespread as was first thought.

**Env 03884     Minoil Services Pty. Ltd.     1981**

EL 625. This tenement was also taken up to investigate the potential of the known lignitic sediments as a carbon source for the liquefaction and/or carbon beneficiation process and covered the Talacootra lignite deposit. One hole was completed to a depth of 92.40 metres early in the life of the tenure and was followed by a further 7 holes that were completed and another 7 holes that were precollared but not deepened. Four of the completed holes encountered basement without cutting lignitic sediments.

**Env 06816     BHP Minerals Ltd.     1988**

EL 1353 was taken up to investigate the heavy mineral sands potential in the Ooldea Ridge. Initial field work involved the collection of stream samples. This was followed by the drilling of 55 shallow RC holes on three traverses for a total of 863.8 metres. Results indicated the presence



of minor zircon and ilmenite at the base of one of the units in holes OL68 and OL69 on Traverse 2. However the almost total lack of rutile, sub-economic quantities of zircon and ilmenite together with the depth to mineralisation and the fine grain size of the heavy minerals led BHP to conclude the area had no worthwhile potential.

## 5.2 Potash Investigations

Results of the SCH literature review, which included historical annual South Australian government mining reviews that date back to 1948, have highlighted the potential of the Pidinga area for the discovery of near-surface potash deposits. A summary of exploration carried out by the South Australian Mines Department exploration in the region in 1948 was published in a paper in *Economic Geology* in 1953 by D. King a government geologist. (Origin of Alunite Deposits at Pidinga, South Australia. *Economic Geology* v. 48, pp. 689-703). Maps showing the location of potash bearing drill holes at Lake ‘C’ were produced in the 1948 report by A. T. Armstrong (*Mining Review* No. 89) and are shown as Figures 3, 4 and 5.

Alunite is a common source of potash, a valuable fertiliser commodity. Alunite is also a common accessory alteration mineral associated with high sulphidation epithermal gold deposits.

## 5.3 Surface Sampling & Drill Program Planning

SCH considers the Pidinga area has the potential to host a significant potash deposit and has planned a modest program of shallow air-core drilling to test this target. Details of this program are outlined in Section 6 below.

As part of the preparation for this drilling program senior SCH company directors carried out a reconnaissance site visit to Pidinga and collected three surface white clay samples that were submitted for potash analysis. Results are shown in Table 1. No significant potash was recorded.

The company has prepared and submitted a Declaration of Environmental Factors (DEF) and is in the process of negotiating an access agreement with native title claimant groups.

**Table 1.**  
**XRF Analyses of Surface Clay Samples.**

Sample No.	MGA_East	MGA_North	Al2O3	CaO	Fe2O3	K2O	MgO	Na2O	SO3	SiO2	TiO2	LOI	Cl
P1	223576	6579678	27.8	0.70	2.78	0.35	1.00	3.18	0.36	45.6	2.55	15.51	4.73
P2	223666	6579685	7.11	8.54	9.14	0.84	4.19	0.83	2.49	52.1	0.52	14.07	0.89
P3	227600	6585530	3.01	21.5	0.72	0.48	0.58	1.02	29.6	39.5	0.10	12.28	0.48

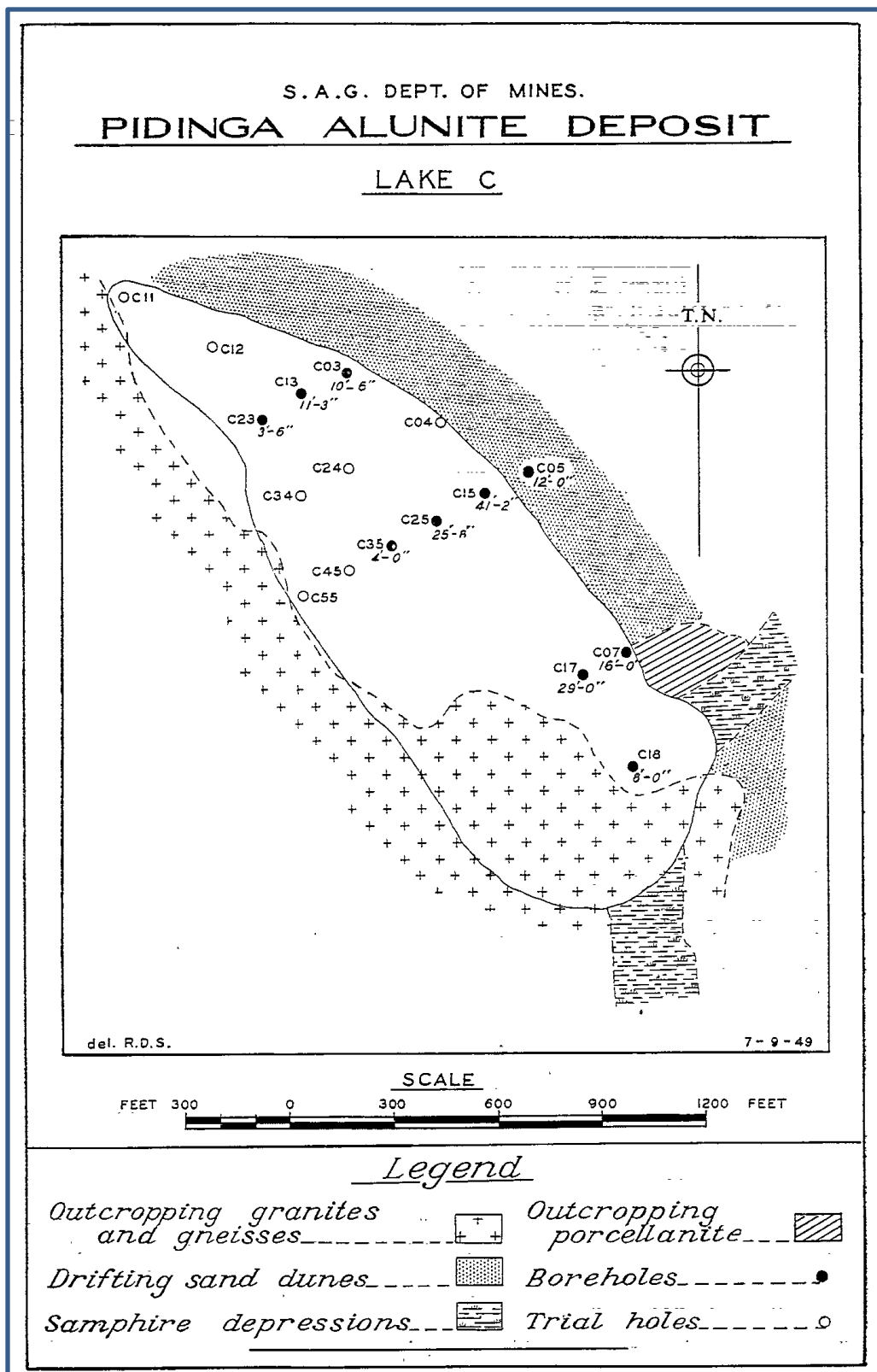


Figure 3. Pidinga Alunite Deposit. Map Prepared by A. T. Armstrong 1948.



S.A.G. DEPT. OF MINES  
**PIDINGA ALUNITE DEPOSIT**  
**LAKE C**  
 SECTIONS SHOWING BORES AND ASSAY VALUES

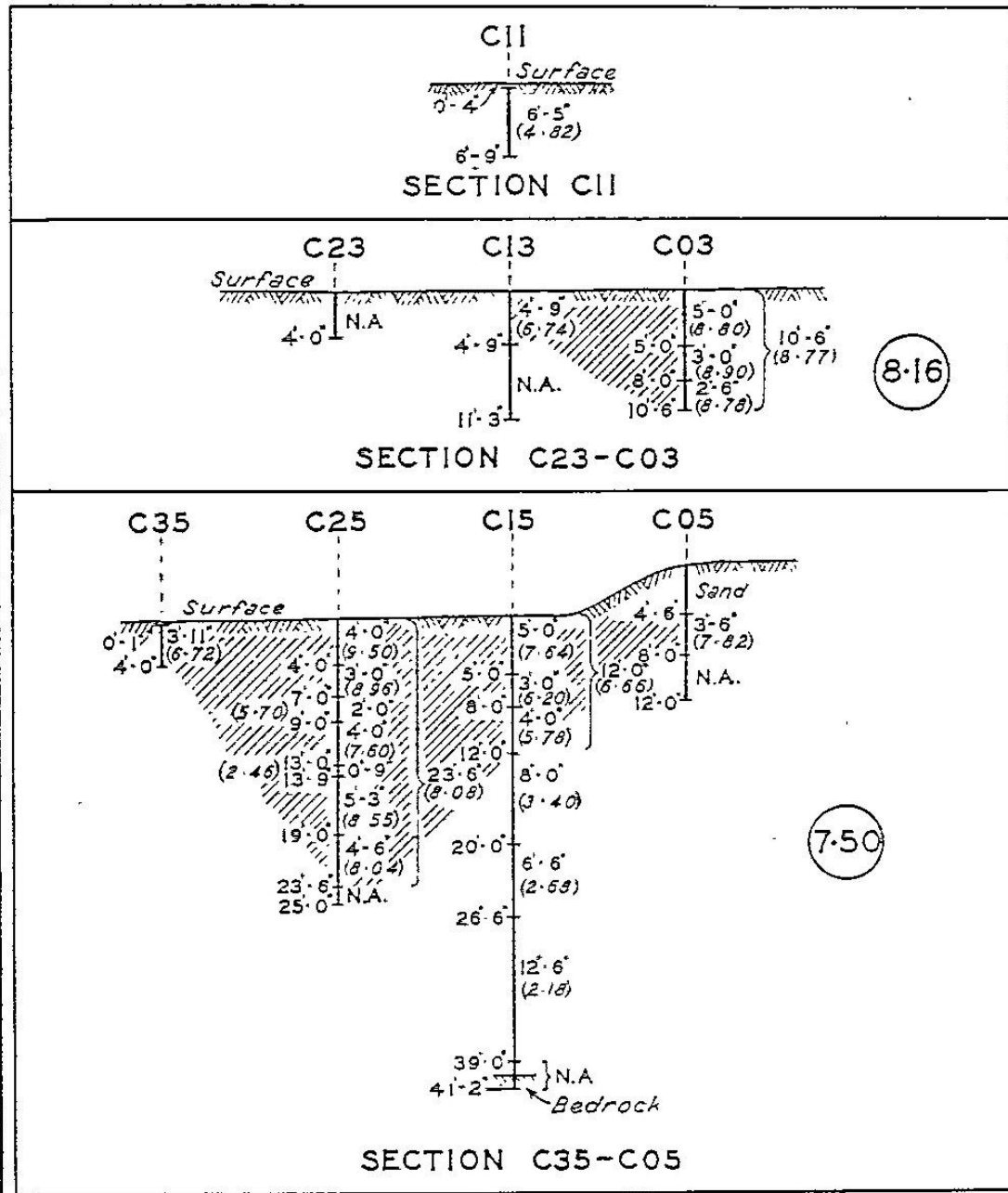


Figure 4. Pidinga Alunite Deposit. Drill Section Prepared by A. T. Armstrong 1948.

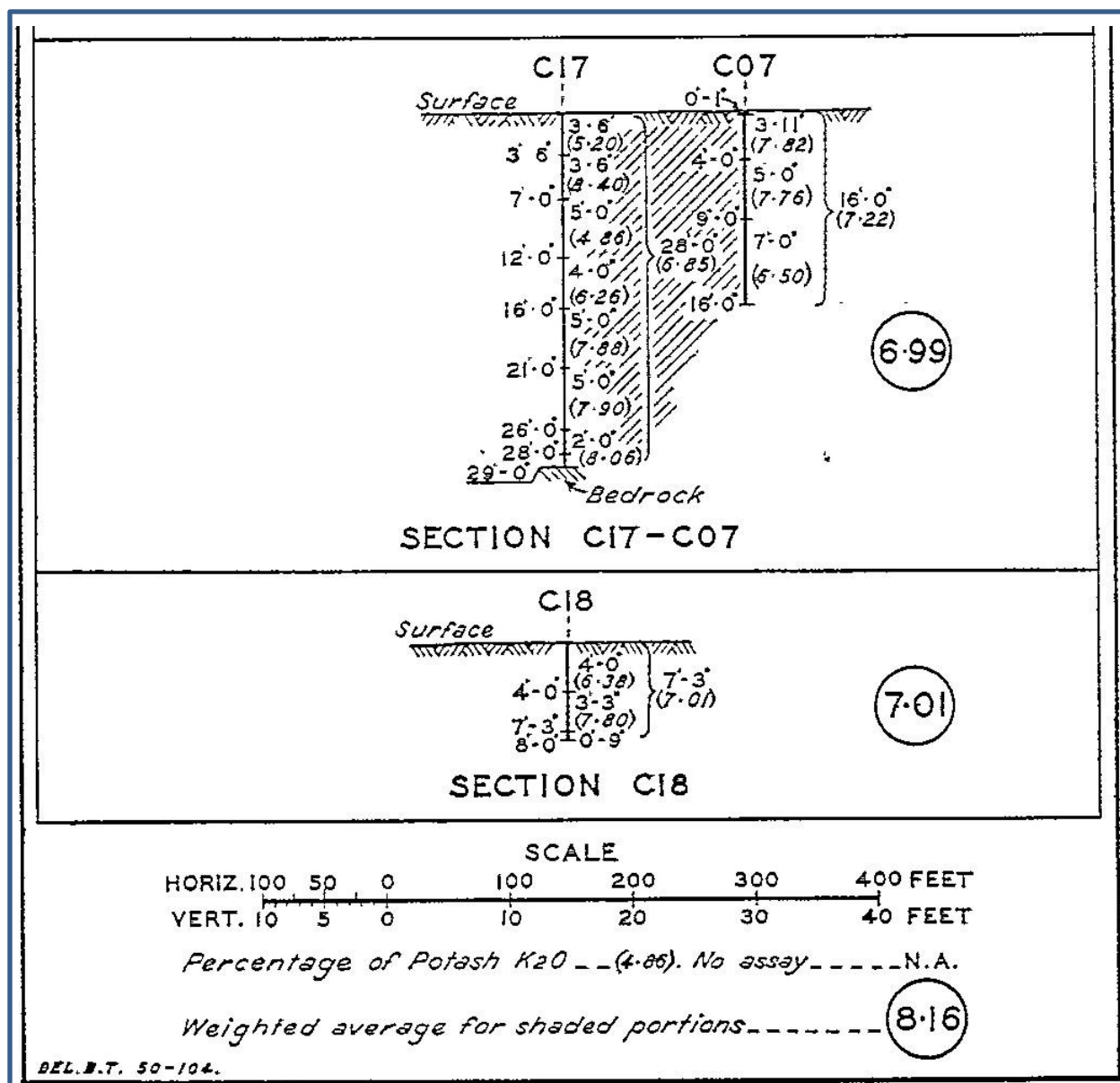


Figure 5. Pidinga Alunite Deposit. Drill Section Prepared by A. T. Armstrong 1948.

## 6. *Planned Future Work*

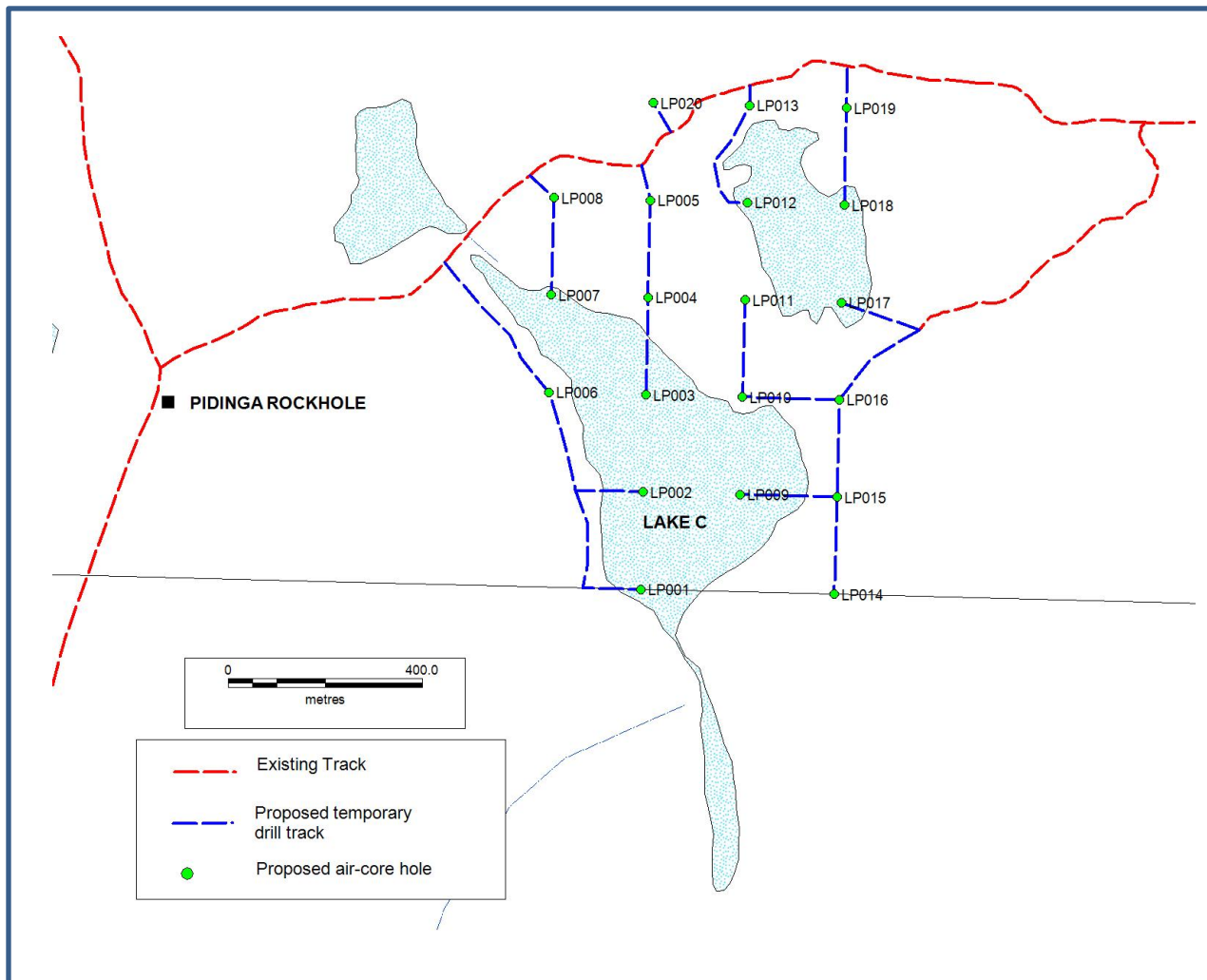
The proposed program will involve the drilling of 20 small diameter vertical air-core drill holes on a grid pattern with 200 metre centres and is designed to outline a resource in the order of 1 million tonnes of alunite bearing clay. SCH will carry out the drilling program using a contractor operated WASDRILL 400D air-core rig mounted on the back of a 6x6 Toyota Landcruiser as shown in Figure 6. This rig is designed for easy access and minimum environmental footprint. It carries an on-board Airman 130 psi 265 cfm compressor. A 6x4 Toyota Landcruiser support vehicle carries rods and a 400 litre water tank. The only other support vehicle anticipated is a single 4x4 vehicle (supervising geologist), field supplies, lunch, first aid kit etc.



*Figure 6. WASDRILL 400D Slimline Air-Core Drilling Rig.*

Each drill hole will be completed using a slimline (7.6 mm) dual tube air-core system that uses a tungsten bit and recovers the sample up through the inner rod string and out through a cyclone attached to the rig. Each hole will be drilled through the target clay horizons and terminated on reaching the harder crystalline basement rocks.

Access to drill sites will be along existing tracks to the closest point to the proposed drill site and then by driving in across the land surface avoiding trees and scrub. No track grading or vegetation clearance will be required. At each hole location the rig will loop around so as to exit the site along the same wheel tracks as were used to gain entry.



*Figure 7. Line drawing showing proposed access to drill sites.*

Upon completion each of the holes will be backfilled with excess sample material and the site rehabilitated accordance with DMITRE Guideline M21. Minor groundwater may be encountered in some of the holes however no confined aquifers are expected to be intersected during the drilling. Compacted areas and new drill tracks will be scarified to loosen the top soil. SCH uses a Coober Pedy based contractor Andrew Brockhoff for its drilling rehabilitation work as do several other exploration companies operating in South Australia. Mr Brockhoff is well versed with DMITRE rehabilitation requirements.

MGA94 Zone 53 drill collar co-ordinates for each of the holes are listed in **Error! Reference source not found.** The anticipated maximum hole depth is 20 metres and accordingly the anticipated maximum metreage of drilling for the overall program is 400m.

**Table 2.**  
**MGA94 Zone 53 Co-ordinates for Proposed Drill Holes.**

Hole_ID	MGA94_East	MGA94_North	Hole_ID	MGA94_East	MGA94_North
LP001	227600	6585000	LP011	227800	6585600
LP002	227600	6585200	LP012	227800	6585800
LP003	227600	6585400	LP013	227800	6586000
LP004	227600	6585600	LP014	228000	6585000
LP005	227600	6585800	LP015	228000	6585200
LP006	227400	6585400	LP016	228000	6585400
LP007	227400	6585600	LP017	228000	6585600
LP008	227400	6585800	LP018	228000	6585800
LP009	227800	6585200	LP019	228000	6586000
LP010	227800	6585400	LP020	227600	6586000

## **7. Expenditure**

### **Expenditure for EL 4631 for the Twelve Month Period Ending 12th December 2011**

<b>Category</b>	<b>\$</b>
Administration	4,289.73
Assaying	298.81
Consultants geological	18,651.96
Legal	4,760.00
Tenement expenses	4,887.45
<b>Total</b>	<b>32,887.95</b>

### **Life to Date Expenditure for EL 4631**

<b>From</b>	<b>To</b>	<b>\$</b>
13 Dec 10	12 June 11	3,405
13 June 11	12 Dec 11	29,483
<b>Total</b>		<b>32,888</b>



**Southern Coal Holdings Pty Ltd**

***Final Annual Report on Exploration Licence 4631***

***Pidinga***

***For the Period 13<sup>th</sup> December 2011 to 12<sup>th</sup> December 2012***

***by***

***Gary J. Jones***

***February 2013***

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## ***Summary***

Exploration by SCH on EL 4631 Pidinga during the two years of the tenure was focused on the previously known lignite deposits and on the potash potential of alunite bearing clays in the vicinity of Lake Ifould

Previous exploration by several companies in this general locality during the 1970's and 1980's was primarily for uranium with lesser exploration effort directed towards the lignite and heavy mineral sands.

SCH had planned a modest program of slimline vertical aircore holes designed to follow up potash intersections made in SA Mines Department drilling as far back as 1948. However the Company was unable to negotiate a satisfactory access agreement with the affected Native Title Claimant groups and consequently the program was abandoned and the exploration licence allowed to expire at the end of the two year term.

Expenditure on EL 4631 for the year ended 12<sup>th</sup> December 2012 was \$111,241.01 and for the term of the licence was \$144,129.

## **1. Introduction**

Southern Coal Holdings Pty Ltd ("SCH") was the operator for Exploration Licence 4631, Pidinga. The project area is centered approximately 200 kilometres north west of Ceduna, in the Eucla Basin and south western portion of the Gawler Craton. The licence covered an area of 357 square kilometres.

The project area was selected to in order to explore for coal and lignite deposits, in an area where several intersections of lignite had been made in drill holes by previous explorers.

SCH considered the Pidinga project area was prospective for coal and lignite deposits as well as near-surface potash deposits. Alunite bearing clays in the vicinity of Lake Pidinga contain significant levels of potash. Alunite is also a prominent alteration mineral associated with high sulphidation epithermal gold deposits.

## **2. Location and Access**

### **2.1 Location and Access**

The Pidinga project is situated in southern South Australia approximately 200 kilometres north west of Ceduna as shown in Figure 1. The project area comprised EL 4631 Pidinga and covered an area of approximately 357 square kilometres. The sealed Eyre Highway is approximately 65 kilometres to the south and the Transcontinental railway line is approximately 20 kilometres to the north. Access to the project area is via the Eyre Highway, thence the Illuka Jacinth-Ambrosia haul road and then along existing tracks. The area is covered by the 1:250,000 Map Sheet Barton SH-5-09 and 1:100,000 map sheets Moondrah 5236 and Pidinga 5336.

### **2.2 Physiography and Land Use**

The topography of the project area is largely flat to undulating and ranges in altitude from around 148m asl in the south-east to 107m asl in the north. There is no permanent surface water in the area however ephemeral creeks drain into numerous small to medium sized salt lakes the most notable being lakes Pidinga and Ifould.

The Pidinga project area is located predominantly within the Yellabinna subregion of the Great Victoria Desert IBRA bioregion, but is also at the boundary of the Yalata and Nullarbor Plain subregions. The Yellabinna subregion supports a series of parallel sand dunes, while the Yalata sub-region to the south of the Pidinga area consists of aeolian sand dunes. The south-east extension of the dune fields of the Great Victorian Desert (GVD) flank the flat plain of the Nullarbor and includes the Ooldea Range, which lies to the east of the Pidinga project and trends north-west to south-west. The Ooldea Range is comprised of a series of linear, longitudinal dunes formed from an ancient shoreline that are constructed largely of quartz sand.

The main land use of the area is conservation and Aboriginal land use, as well as mineral exploration, and limited tourism. The lack of access, water and general isolation of areas within the Yellabinna Regional Reserve, such as the Pidinga area, has contributed to the lack of visitation and pastoral development within the area.

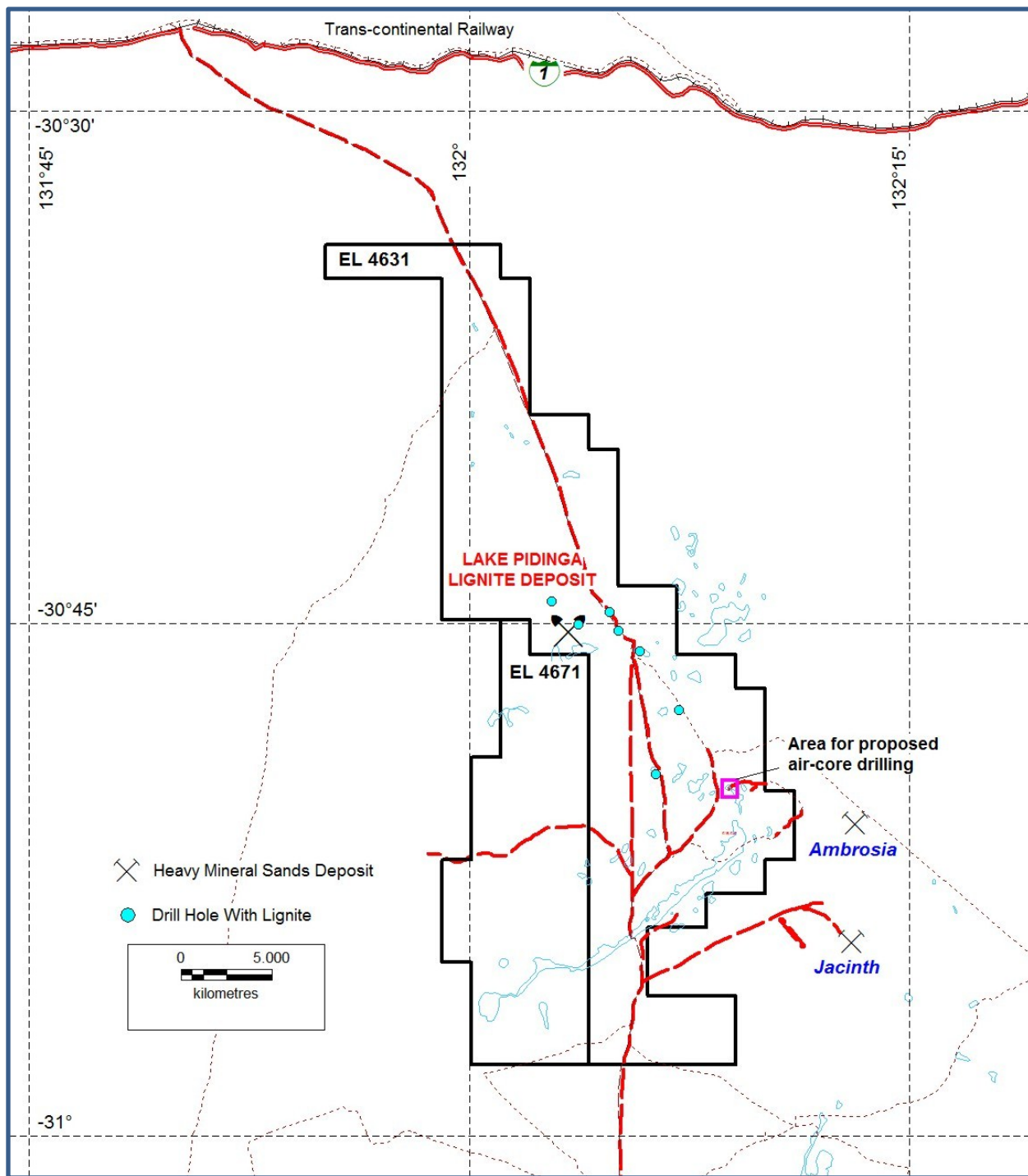


Figure 1. EL 4631 Pidinga Locality Diagram.

## 2.3 Climate

The Pidinga area has a mediterranean type climate with hot, dry summers and cool, wet winters. July is the wettest month. The average yearly precipitation is just under 300mm at the coast and diminishes northward into the interior, becoming increasingly semi-arid. The Goyder's Line, which demarcates the edge of the area where rainfall is generally sufficient to support agriculture, starts near Ceduna.

## 3. Tenure

### 3.1 Tenement Details

Exploration Licence 4631 covered an area of 357 square kilometres. The tenement was situated wholly within the boundaries of the Yellabinna Regional Reserve. EL 4631 was granted to Southern Coal Holdings Pty Ltd a wholly owned subsidiary of WPG Resources Ltd ("WPG") on the 13<sup>th</sup> of December 2010 and expired on the 12<sup>th</sup> of December 2012.

### 3.2 Landowners

EL 4631 was situated within the area covered by the Alinytjara Wilurara Natural Resources Management (NRM) Board, which covers 26% of the State. The area was within the Great Victorian Desert Environmental Region, and the Yellabinna Environmental Association

Throughout the region, there is a high degree of cultural connection to Aboriginal Lands and traditional ownership is recognised. The Far West Coastal Group, representing the Mirning, Wirangu, Maralinga Tjarutja, Yalata and Yabi Dinah groups, are the native title claimants within the project area. The Claim is registered with the National Native Title Tribunal. In particular, formal Aboriginal Lands closest to the project area includes the Yalata Lands (approximately 4600 km<sup>2</sup>) and the Maralinga Lands (approximately 100 000 km<sup>2</sup>). Several Aboriginal communities exist within these Aboriginal Lands and utilise the Yalata and Maralinga Lands.

The Yalata Aboriginal Lands are protected under the *Aboriginal Lands Trust Act 1966*, which vests inalienable freehold title in the Aboriginal Lands Trusts (ALT) and makes the ALT the 'landowner'. It is ALT policy to lease the land it owns to the appropriate Aboriginal community and family organisations and the Yalata Lands are leased back to the Yalata community at the local level. The ALT Board includes representatives from the various Aboriginal communities located on ALT Lands. The Yalata community township now comprises about 160 people.

The Maralinga Tjarutja Aboriginal Lands (MT Lands) lie further north of the Yalata Lands. *Maralinga Tjarutja Land Rights Act 1984* vests the land in MT under inalienable freehold title.

The members of Maralinga Tjarutja Council are elected members from the community. The population of the MT Lands consists of about 100 people in 20 families, including staff based at the Oak Valley community. Oak Valley is now the population centre of the MT Lands and the number of people in the community rises significantly during cultural activities. There is regular movement of people between Ceduna, Yalata, Oak Valley, and other communities in the Region

### **3.3 Aboriginal Heritage Clearance**

An extensive effort was made by SCH to negotiate the necessary Native Title Mining Agreements in order for exploration to proceed within the variously affected Native Title Claimant Groups Lands. These included a site visit by an SCH consultant with tribal representatives of the Far West Coast Traditional Lands Association, meetings with the respective groups in Ceduna and numerous phone calls, emails and other correspondence. Unfortunately no satisfactory agreement could be reached particularly in regard to the drilling of a few slimline aircore holes in the dry lake bed.

## **4. Regional Geology**

The Pidinga project area was located on the eastern margin of the Eucla Basin. The Eucla Basin extends from Balladonia in Western Australia to east of Ooldea in South Australia.

Paleoproterozoic basement rocks comprise banded acid, intermediate and basic gneiss and schist and some granite all cut by pegmatite and quartz veins and are correlated with the Cleve Metamorphic suite of the Lincoln Complex. Outcrops are present along the north-western shore of Lake Ifould and occasionally within the lake bed itself.

The basement rocks are overlain by the Eocene Pidinga Formation sediments which includes sand, minor shales, lignitic clays and clayey lignites. The formation was deposited in a non-marine environment with the exception of the uppermost units that show evidence of the onset of a major mid-Eocene marine transgression. A sandy unit at the top of the Pidinga Formation may be Hampton Sandstone identified in previous drill holes and elsewhere in the Eucla Basin.

The Nullabor Limestone of Miocene age unconformably overlies the Pidinga Formation and wedges out against the Precambrian basement approximately 15 kilometres to the north east and east of Chundie Swamp. This is a hard crystalline fossiliferous limestone that forms a cap over the underlying sediments. The top of the Nullabor Limestone marks the end of Tertiary marine deposition period..

A thin veneer of Quaternary sediments that comprise alluvium, sand dunes, sandy and calcareous soil and lake deposits blankets the eastern side of the Eucla Basin. A regional geological map is shown in Figure 2.

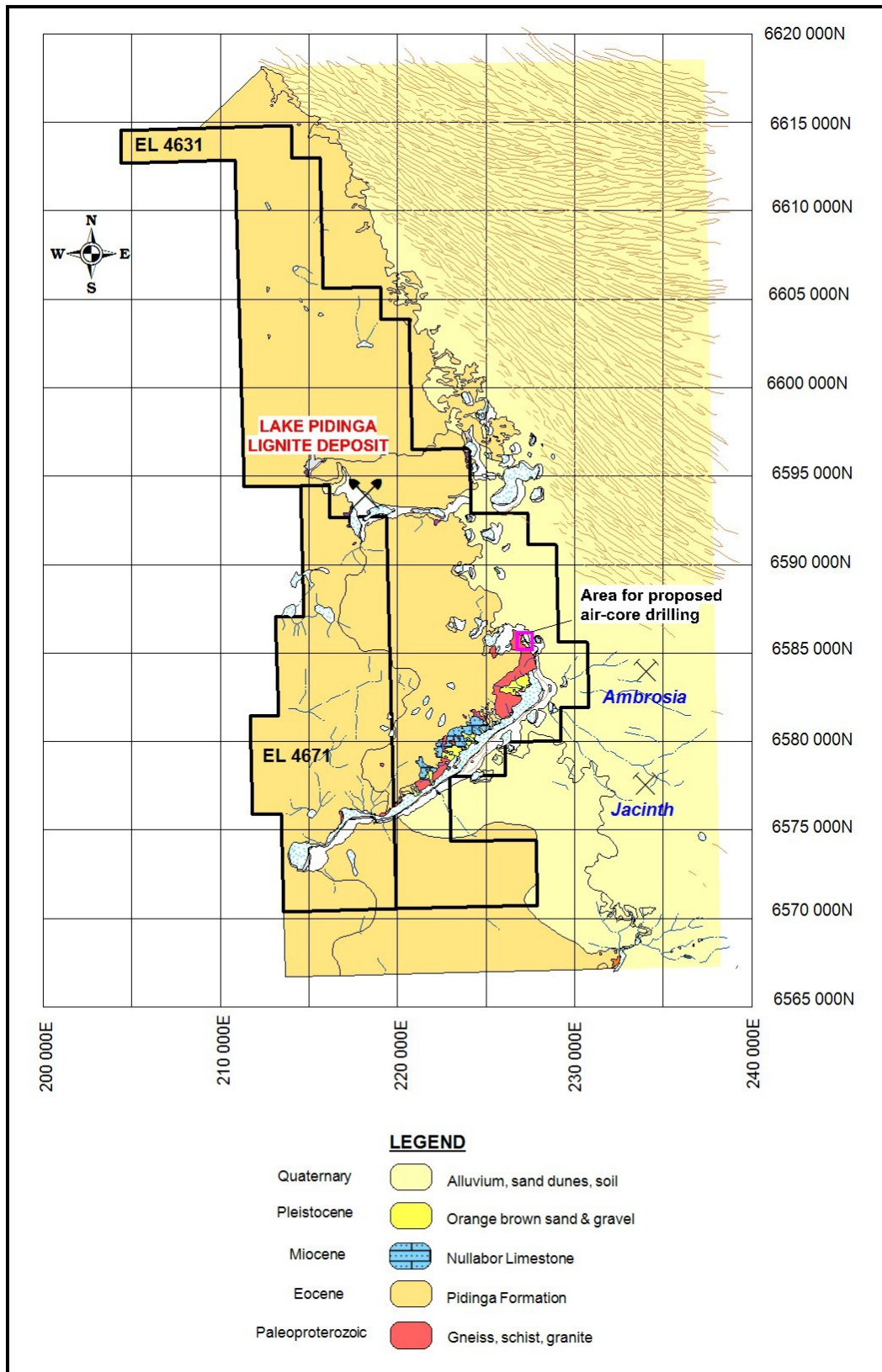


Figure 2. Pidinga EL 4631 Regional Geology



## **5. Work Completed**

### **5.1 Literature Review**

During the initial six month reporting period Southern Coal Holdings Pty Ltd (SCH) completed a full and detailed literature review and assessment of all the previous exploration including the drilling of 129 holes within the area covered by the current tenement. Results of this study have shown that although intersections of lignite were made in 57 of these holes the potential for a significant deposit of lignite is limited. Results of the literature review are summarised below.

#### **Env 00869 Mines Administration Pty Ltd. 1968**

A drilling program of eight holes aggregating 284 feet (86.6 metres) was carried out to determine the quantity and composition of the brines in the Talacootra - Pidinga lake systems with particular reference to the occurrence of potash or other valuable dissolved salts. The drilling indicated that the most extensive deposits of alunitic clay occurred in Lake C and that water bearing lake sediments were confined to Lake C and a narrow strip of the Main Lake. The total volume of brine present was therefore considered to be very limited.

#### **Env 01200 Australasian Mining Corp. Ltd. 1970**

Preliminary field reconnaissance in the Pidinga Lake – Lake Talacootra – Red Lake – Seven Mile Swamps area revealed significantly high radioactivity that was found to be restricted to minor discontinuous outcrops and minor near surface sample intervals in auger holes drilled in saline lagoons. Follow up work comprised a series of ground and airborne traverses with a hand held scintillometer and later a more comprehensive airborne radiometric survey. Anomalies were tested with a total of 97 holes for an aggregate 11,392 feet (3,742 metres). Minor low grade uranium mineralisation was located in basal conglomerates and in some lignite intervals. Alunitic clay was logged from eleven of the drill holes.

#### **Env 01316 Australasian Mining Corp. Ltd. 1970**

Exploration was carried out in conjunction with that reported in Env01200. Highest radioactivity was recorded from lignite beds north and west of Pidinga Lake. Thirty six holes for 3,649 feet (1,112 metres) were drilled in the lease area.

#### **Env 02169 Pechiney (Australia) Exploration Pty. Ltd. 1974**

EL 10. Airborne radiometric survey and rotary drilling in 43 holes for 1,677.9 metres testing radiometric anomalies. No results were reported.

#### **Env 02170 Pechiney (Australia) Exploration Pty. Ltd. 1974**

Exploration on EL 9 was carried out in conjunction with that on EL 10 and reported in Env02169. Rotary drilling in 29 holes for 1,432.4 metres testing radiometric anomalies. No results were reported.

#### **Env 02435 Pechiney (Australia) Exploration Pty. Ltd. 1974**

Final report for part of the area explored in EL 10 that was to be relinquished. Pechiney concluded that the uranium prospects on EL 10 appeared to be poor. Drilling had established the presence of weak radioactivity connected with clayey lignitic facies of the Pidinga Formation. The lignites were considered to have a limited lateral development and therefore it appeared unlikely that economic uranium concentrations would occur.

**Env 02504    Pechiney (Australia) Exploration Pty. Ltd.    1975 - 1976**

EL 164 covered the reduced part of EL 10. Exploration comprised track etch surveys, ground geological investigation of radiometric anomalies, soil rock and water sampling. Drilling comprised 10 holes for a total of 311 metres and all holes were down hole scintillometer probe logged. Neither drilling nor track etch surveys gave encouraging results and the radiometric anomalies were attributed to radium and/or radon in the ground waters or to concentrations of uranium daughter products in the evaporates on the surface of the salt lakes.

**Env 03105    South Australia Department of Mines & Energy (SADME).    1977**

EL 281. Lignite and brown coal exploration that was carried out by SADME. Five holes were drilled at Pidinga but only two intersected lignitic sediments. The thickest seam was in Pidinga No.1 but samples recorded high ash contents that ranged from 55% to 75% on a dry basis. Overall it was concluded that the lignite occurred in small lenses and that reserves would be negligible. Added to that was the detraction of high ash content.

**Env 03829    Minoil Services Pty. Ltd.    1980**

EL 601. This tenement was taken up to investigate the potential of the known lignitic sediments as a carbon source for the liquefaction and/or carbon beneficiation process and covered the Pidinga lignite deposit. One hole was completed to a depth of 62.79 metres early in the life of the tenure and 14 further holes were later precollared but not deepened. Five of the pre-collar holes reached basement at shallow depths without intersecting lignitic material indicating the occurrence of lignitic sediments was not as widespread as was first thought.

**Env 03884    Minoil Services Pty. Ltd.    1981**

EL 625. This tenement was also taken up to investigate the potential of the known lignitic sediments as a carbon source for the liquefaction and/or carbon beneficiation process and covered the Talacootra lignite deposit. One hole was completed to a depth of 92.40 metres early in the life of the tenure and was followed by a further 7 holes that were completed and another 7 holes that were precollared but not deepened. Four of the completed holes encountered basement without cutting lignitic sediments.

**Env 06816    BHP Minerals Ltd.    1988**

EL 1353 was taken up to investigate the heavy mineral sands potential in the Ooldea Ridge. Initial field work involved the collection of stream samples. This was followed by the drilling of 55 shallow RC holes on three traverses for a total of 863.8 metres. Results indicated the presence of minor zircon and ilmenite at the base of one of the units in holes OL68 and OL69 on Traverse

2. However the almost total lack of rutile, sub-economic quantities of zircon and ilmenite together with the depth to mineralisation and the fine grain size of the heavy minerals led BHP to conclude the area had no worthwhile potential.

## 5.2 Potash Investigations

Results of the SCH literature review, which included historical annual South Australian government mining reviews that date back to 1948, have highlighted the potential of the Pidinga area for the discovery of near-surface potash deposits. A summary of exploration carried out by the South Australian Mines Department exploration in the region in 1948 was published in a paper in Economic Geology in 1953 by D. King a government geologist. (Origin of Alunite Deposits at Pidinga, South Australia. Economic Geology v. 48, pp. 689-703). Maps showing the location of potash bearing drill holes at Lake ‘C’ were produced in the 1948 report by A. T. Armstrong (*Mining Review No. 89*) and are shown as Figures 3, 4 and 5.

Alunite is a common source of potash, a valuable fertiliser commodity. Alunite is also a common accessory alteration mineral associated with high sulphidation epithermal gold deposits.

## 5.3 Surface Sampling

SCH considered the Pidinga area has the potential to host a significant potash deposit and had planned a modest program of shallow air-core drilling to test this target. Details of this program are outlined in Section 6 below.

As part of the preparation for this drilling program senior SCH company directors carried out a reconnaissance site visit to Pidinga and collected three surface white clay samples that were submitted for potash analysis. Results are shown in Table 1. No significant potash was recorded.

**Table 1.**  
**XRF Analyses of Surface Clay Samples.**

Sample No.	MGA_East	MGA_North	Al2O3	CaO	Fe2O3	K2O	MgO	Na2O	SO3	SiO2	TiO2	LOI	Cl
P1	223576	6579678	27.8	0.70	2.78	0.35	1.00	3.18	0.36	45.6	2.55	15.51	4.73
P2	223666	6579685	7.11	8.54	9.14	0.84	4.19	0.83	2.49	52.1	0.52	14.07	0.89
P3	227600	6585530	3.01	21.5	0.72	0.48	0.58	1.02	29.6	39.5	0.10	12.28	0.48

## 5.4 DEF

The company prepared and submitted a Declaration of Environmental Factors (DEF) which was held in abeyance pending a satisfactory outcome to negotiations for access agreements with native title claimant groups.

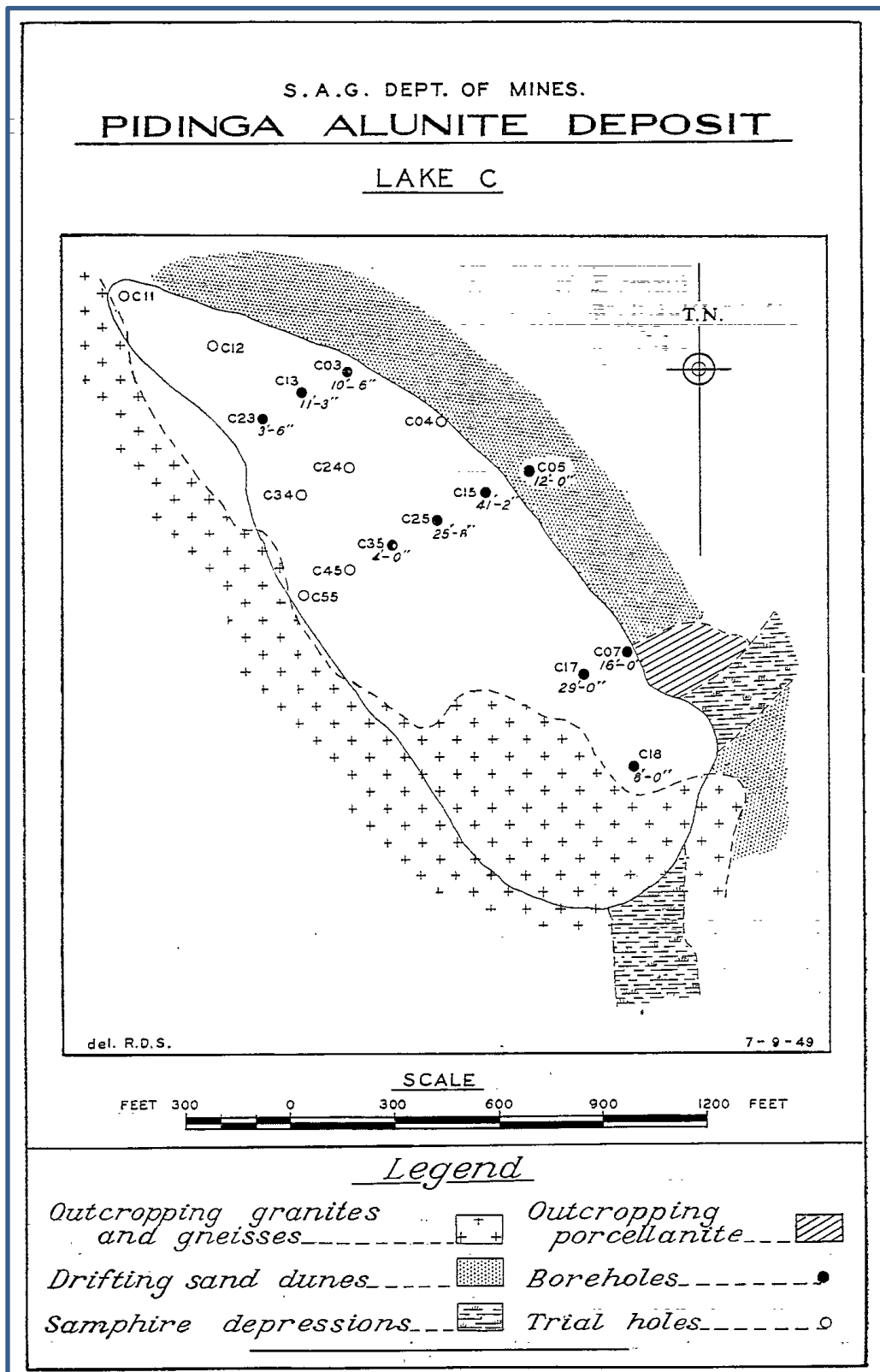


Figure 3. Pidinga Alunite Deposit. Map Prepared by A. T. Armstrong 1948.

S.A.G. DEPT. OF MINES  
**PIDINGA ALUNITE DEPOSIT**  
**LAKE C**  
 SECTIONS SHOWING BORES AND ASSAY VALUES

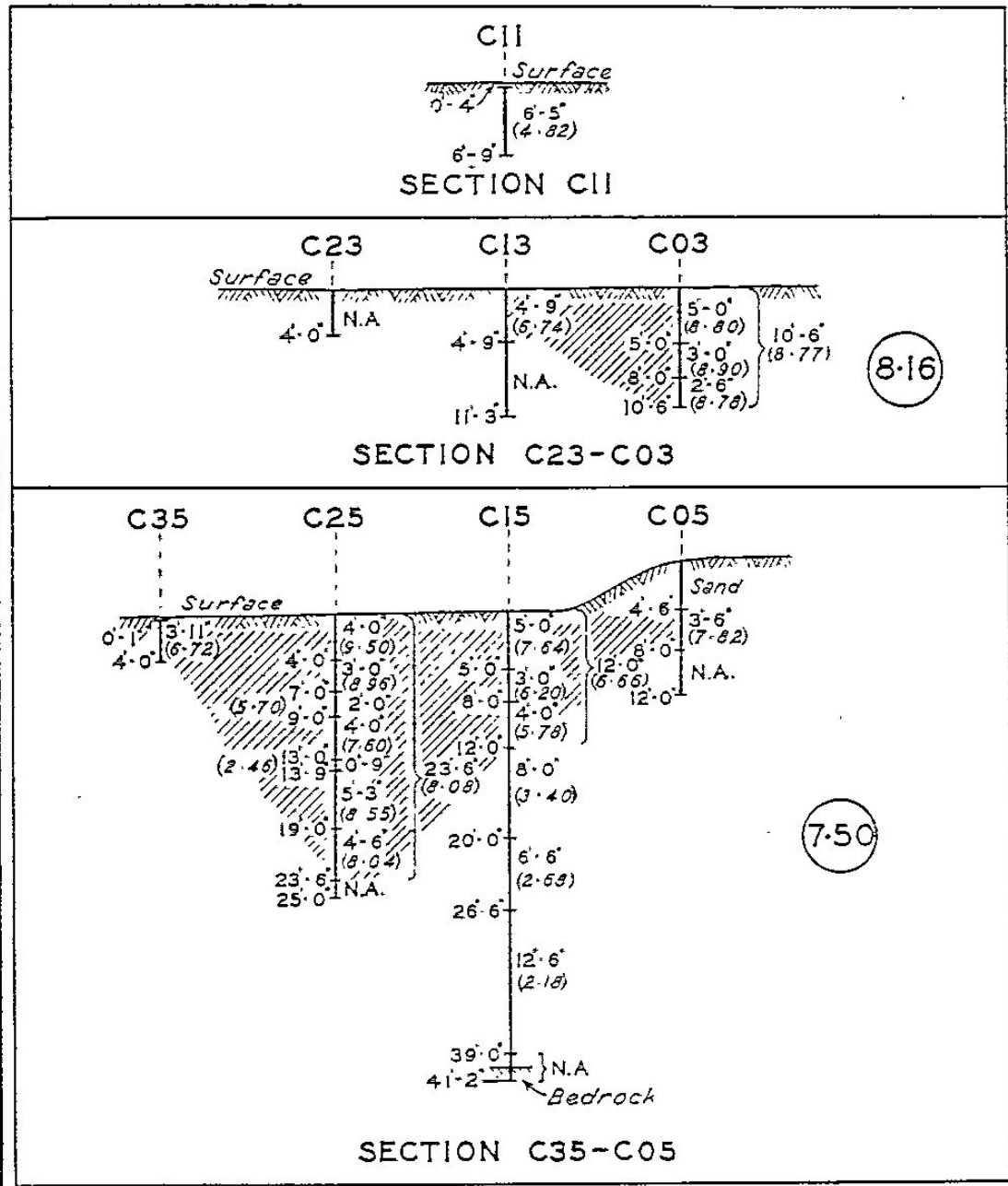


Figure 4. Pidinga Alunite Deposit. Drill Section Prepared by A. T. Armstrong 1948.

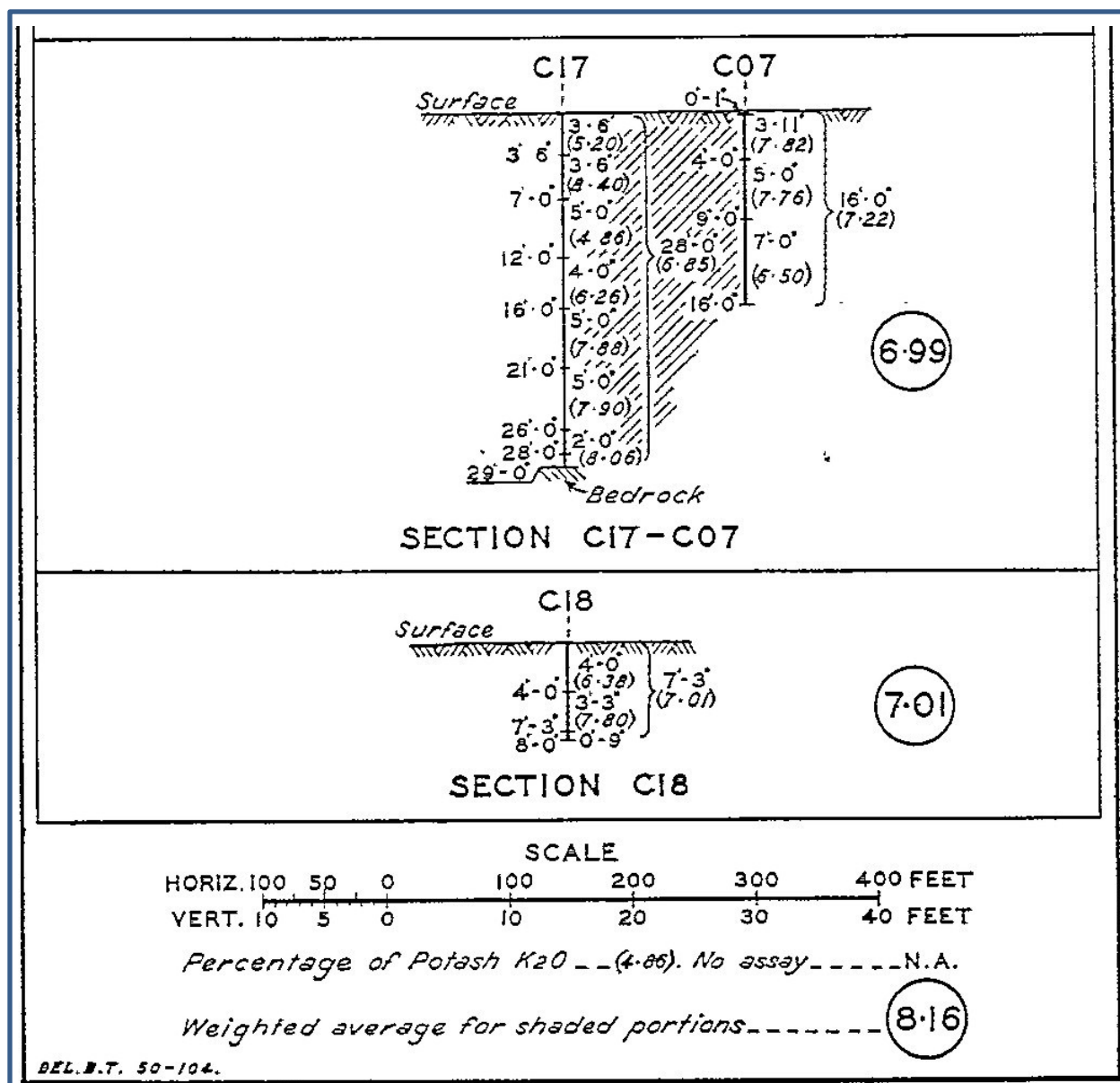


Figure 5. Pidinga Alunite Deposit. Drill Section Prepared by A. T. Armstrong 1948.



## 5.5 Planned Drilling Program

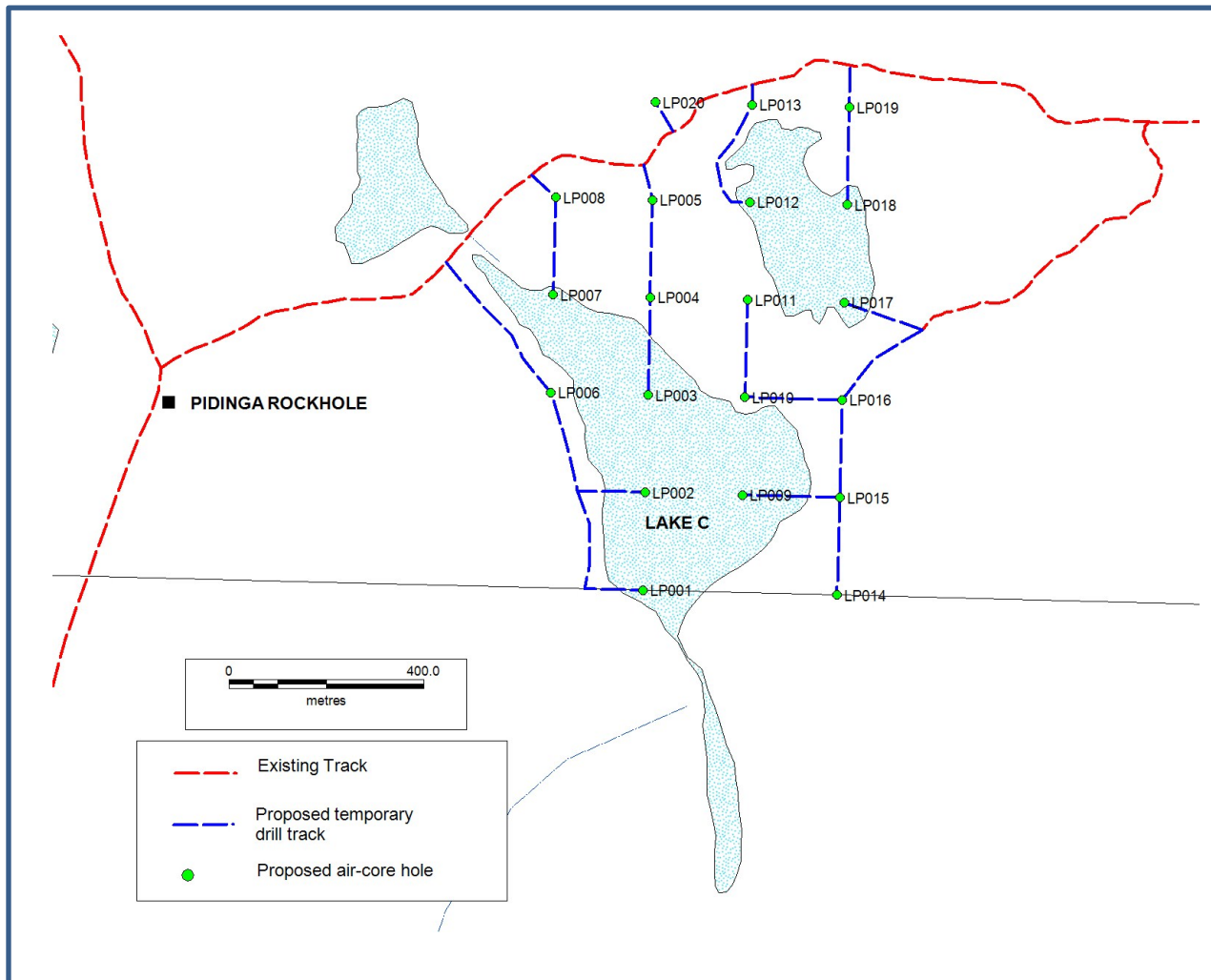
The proposed drilling program would have been for 20 small diameter vertical air-core drill holes on a grid pattern with 200 metre centres and was designed to outline a resource in the order of 1 million tonnes of alunite bearing clay. SCH planned to carry out the drilling program using a contractor operated WASDRILL 400D air-core rig mounted on the back of a 6x6 Toyota Landcruiser as shown in Figure 6. This rig is designed for easy access and minimum environmental footprint. It carries an on-board Airman 130 psi 265 cfm compressor. A 6x4 Toyota Landcruiser support vehicle carries rods and a 400 litre water tank. A single 4x4 vehicle (supervising geologist), field supplies, lunch, first aid kit etc would have provided back-up support.



*Figure 6. WASDRILL 400D Slimline Air-Core Drilling Rig.*

Each drill hole was to have been completed using a slimline (7.6 mm) dual tube air-core system that uses a tungsten bit and recovers the sample up through the inner rod string and out through a cyclone attached to the rig. Each hole was planned to be drilled through the target clay horizons and terminated on reaching the harder crystalline basement rocks.

Access to drill sites would have been along existing tracks to the closest point to the proposed drill site and then by driving in across the land surface avoiding trees and scrub. No track grading or vegetation clearance would have been required.



*Figure 7. Line drawing showing proposed access to drill sites.*

MGA94 Zone 53 drill collar co-ordinates for each of the proposed drill holes are listed in Table 2. The anticipated maximum hole depth was 20 metres and accordingly the anticipated maximum metreage of drilling for the overall program was 400m.

The program was abandoned as a result of the inability to conclude an access agreement with Native Title Claimant Groups.



**Table 2.**  
**MGA94 Zone 53 Co-ordinates for Proposed Drill Holes.**

Hole_ID	MGA94_East	MGA94_North	Hole_ID	MGA94_East	MGA94_North
LP001	227600	6585000	LP011	227800	6585600
LP002	227600	6585200	LP012	227800	6585800
LP003	227600	6585400	LP013	227800	6586000
LP004	227600	6585600	LP014	228000	6585000
LP005	227600	6585800	LP015	228000	6585200
LP006	227400	6585400	LP016	228000	6585400
LP007	227400	6585600	LP017	228000	6585600
LP008	227400	6585800	LP018	228000	6585800
LP009	227800	6585200	LP019	228000	6586000
LP010	227800	6585400	LP020	227600	6586000

## 7. *Expenditure*

### Expenditure for EL 4631 for the Twelve Month Period Ending 12th December 2012

Category	\$
Accommodation, meals	1,033.00
Airfares, travel	7,586.53
Consultants: General	12,941.02
Consultants: Geological	33,108.53
Field supplies	17.36
Legal	4,162.90
Maps, stationery, data	218.52
Native title	36,753.49
Tenement expenses	77.26
Vehicle running costs	203.13
Vehicle hire	\$629.59
Office costs	\$14,509.68
<b>Total</b>	<b>111,241.01</b>

### Total Expenditure Summary for EL 4631

From	To	\$
13 Dec 10	12 June 11	3,405
13 June 11	12 Dec 11	29,483
13 Dec 11	12 June 12	110,894
13 June 12	12 Dec 12	347
<b>Total</b>		<b>144,129</b>