

AUSTRALASIAN MINING CORPORATION LTD.

Uranium Investigation Project

Pidinga Lakes Area

South Australia

Report No. 1

by

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SUMMARY

A preliminary field reconnaissance northwest of Ceduna, South Australia, in the Pidinga Lake - Lake Tallacootra - Red Lake - Seven Mile Swamps Areas has revealed significantly high radioactivity in the sedimentary rocks of Tertiary age on the eastern edge of the Nullarbor Plain.

Complete mineralogical studies are presently in progress but radium in minor proportions has been tentatively identified as the major radioactive source. Other radioactive minerals are present and are geochemically anomalous.

Investigations completed to date suggest that while the anomalous radioactivity was found to be restricted to minor discontinuous outcrops and to minor intervals found at the near surface of saline lagoons, many of the classical lithological prerequisites for a sedimentary uranium deposit nearby are present in the areas inspected.

Since only a relatively few shallow auger holes were completed during the reconnaissance, additional work is highly recommended to test selected areas in and around the reconnaissance localities.

GENERAL

This report is a brief summary of the results obtained from a preliminary field reconnaissance northwest of Ceduna, South Australia, (See Plate 1).

A scintillometer with detachable probe for down-hole logging of shallow holes as well as for background reconnaissance was used throughout the investigation. Starting from Penong, (See Plate 1), occasional stops were made to check the lithologic nature and radioactive character of the Quaternary, Tertiary and Precambrian rocks. Continuous scintillometer traverses were made during travel; background gamma levels, mileage and geographic comments were recorded to aid in future investigations of the area, (See Appendix 1).

In areas having high gamma backgrounds, detailed scintillometer traverses were completed on foot and auger holes were hand drilled in selected areas of notably high radioactivity.

In general, hand augering was not successful. In many cases the water table was within four feet of the surface and when intersected, made sample recovery difficult, if not impossible. Also owing to the very tight clays encountered, the augering device was twisted off several times.

When water was not a problem, only a penetration of approximately eight feet was usually possible with the auger and therefore limited the scope of the investigations.

Tertiary outcrops, excluding limestones which are locally numerous, are scarce. However, when Tertiary clastics were encountered, they were generally above background gamma radiation levels. It became clear early in the reconnaissance that where found, a ferruginous, possibly laterised, sandstone locally exhibited very high gamma radiation. Also, associated with the sandstone, yellow clay and sand were found in auger holes in and around the saline lagoons to be similarly high in radiation, i.e., many instances greater than 50,000 counts per minute. However, based only on the information available, the anomalous radioactivity appears to be restricted to isolated areas from five feet to 200 feet in extent and may be directly related to relatively recent lagoonal deposition, especially if the highly insoluble secondary detrital mineral radium is found to be the major constituent of the radioactive sediments. Therefore, the specific areas of high radiation encountered during the reconnaissance are considered to be only useful as a guide to areas of interest in the immediate vicinity and surrounding areas.

At this early stage of regional exploration, and since the field data obtained is limited in scope, only preliminary implications will be discussed here. Further investigations on sample mineralogy and a microscopic study of the samples recovered is necessary before the level of confidence can be raised above a preliminary status.

Details regarding field data of auger holes drilled in the reconnaissance areas, and a list of designations for the samples recovered are included in Appendix 2 and 3 respectively.

REGIONAL GEOLOGY

The saline lagoons bordering the eastern edge of the Nullarbor Plain form a northwest-southeast striking former strand line of the Eucla Basin during early Miocene and Oligocene times. The sediments are mainly of shallow marine to shallow lacustrine origin, with calcareous silts, alunitic clays, sands and lignites having been deposited on an irregular Precambrian erosional surface, (See Figure 1). A shallow marine, Middle Miocene limestone transgressed in an eastwardly direction eroding in part, some of the earlier lacustrine deposits down to erosion-resistant Precambrian level. The Middle Miocene limestone overlies in many areas Precambrian intrusives without any observable transitional clastic beds. A partially clastic basal interval is suggested as being widespread, however, west of the indicated strand line of Oligocene to early Miocene age, (King, 1950).

During Pleistocene time, high rainfall, heavy run-off and therefore rapid erosion of Miocene sediments began a drainage system now observed in subdued form in the saline lagoonal areas. These lagoons, once extending for tens of square miles were, and still are, sites of groundwater recharge into the limestones and

FIGURE 1

Generalised Stratigraphic Succession of Pidinga Lake

MAXIMUM OBSERVED THICKNESS	SECTION	DESCRIPTION OF STRATA	PALAEONTOLOGICAL DATA	AGE AND ENVIRONMENT
4'-0"		Flour gypsum & sand gypsum - Wind blown		RECENT Terrestrial
12'-0"		Fossiliferous silicified limestone - abundant quartz grit.	Foraminifera: <i>Astrorhynchus</i> <i>beudanticus</i> <i>Marginopora</i> <i>Verbeekia</i> etc. (Craspin)	MIDDLE MIOCENE Shallow Marine
4'-0"		Porcellanised claystone and grit, surface quartzite etc.	Radiolaria: <i>Cenosphæna</i> (Craspin)	
3'-0"		Pale yellow and green gypsaceous quartz sand and grit		
5'-0"		White friable gypsaceous clay - some salinilla crystals		
4'-0"		Pale gray sandy clay patches of ironstone and ferruginous sandstone		
26'-0"		White and vari coloured alunitic clay	Lower beds are unfossiliferous	LOWER MIOCENE Mainly shallow lacustrine
7'-0"		Red, brown and yellow fine ochraceous sand or ochraceous sandstone crust.		
2'-6"		Yellow, red and gray mottled clay - sandy.		
6'-6"		Vari-coloured iron stained mottled clay		
3'-0"		Yellow gray and brown clay, some gypsum crystals.		
2'-0"		Carbonaceous sandy clay stained with iron oxide		
46'-0"		Lignitic Series Carbonaceous clay and sand with fragments of decomposed wood and pyrites.	Pollen & Spores of families: Protococcae Myricaceae Esoeridaceae Fagaceae (Pike)	OLIGOCENE Lacustrine
1'-0"		Gray clay with some carbonaceous material		
15'-0"		White and iron-stained gritty alunitic clay with the texture of decomposed gneiss		DECOMPOSED PRE-CAMBRIAN
		Gneissic granite, epidiorite and amphibolite etc.		PRE-CAMBRIAN Metamorphic

After KING, 1950

possible basal sandstones of the Nullarbor Plain
- - Eucla Basin to the west, (King, 1949).

Very little is known of the detailed geology in the area, but King, 1950, and 1968, has investigated the area for a university study (M.Sc.) and recently with respect to the alunite he reported in 1950. Lignite was discovered during the early 1900's. Subsequent drilling and exploration have proved that both the alunite and lignite are of little commercial value.

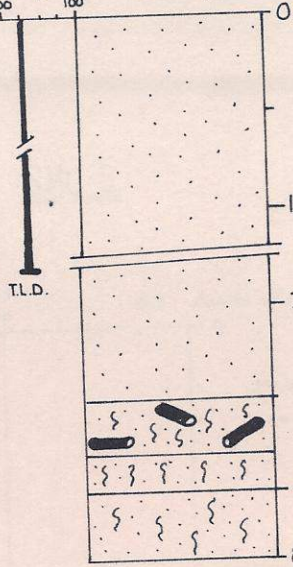
Some general prospecting has been done in the area for copper mineralization during the 1940's. General prospecting by locals has also been done during the early 1950's and old lease pegs were noted at several localities visited. Reportedly, some of the highly radioactive areas have been previously investigated by a geologist engaged by a local landowner (Mr. Laws) during 1954. No scout drilling or exploration surrounding the lagoonal areas have been done however.

SML-3

Gamma Activity (counts per min.)
5000 1000 500 100 0

NOTE: Approx. 10' higher than Lake bed.

NOTE:
NO WATER STRUCK



Sand, partly consolidated, light to med. brown, well sorted, fine to med. grained, silty in part.

Clay, med. red, w/quartz grains & lignite fragments in clay. (Sample SML3-1)

Clay, dark red, sandy.

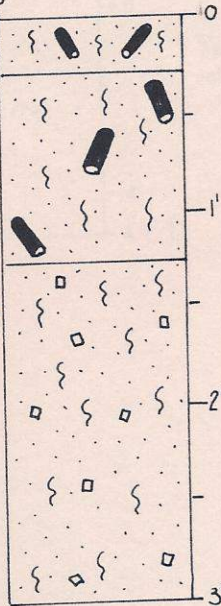
Clay, white, sandy in part, w/weathered mineral inclusions. (Sample SML3-2)

SML-4

Gamma Activity (counts per minute)
15000 10000 5000 1000 500 100 0

SWL

T.L.D.



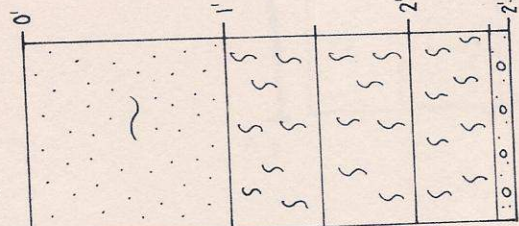
Clay, ligneous, light red, sandy in part. (Sample SML4-1)

Sand, light red, clayey w/lignite fragments. (Sample SML4-2)

Clay, med brown, micaceous, sandy, med. to fine grained, well sorted & well rounded. (Sample SML4-3)

P-5

Gamma Activity (counts per min.)



Sandy, light brown, slightly silty, well rounded.

Clay, light gray, very plastic.

Clay, medium grey, w/occasional medium grained quartz.

Clay, med. grey to offwhite.

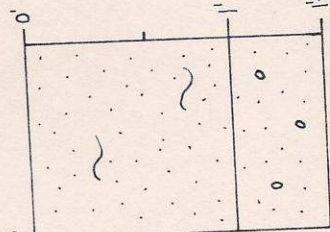
Sand, consolid. ferruginous.

NOTE:
NO WATER STRUCK

T.L.D.

P-6

Gamma Activity (counts per min.)



Sand, light to med. browns, slightly silty, well sorted.

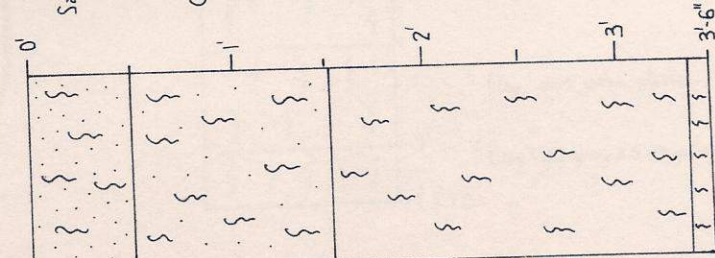
Sandstone, slightly consolidated to very consolidated at bottom, ferruginous, med. grained laterised?

NOTE:
NO WATER STRUCK

T.L.D.

P-7

Gamma Activity (counts per minute)



Sand, clayey, reddish brown, light.

Clay, dark yellow, w/clean well rounded quartz grains.

Clay, medium brown clay, very plastic, ferruginous staining throughout.

Clay, dark yellow, very tight.
(Sample P-7-1)

NOTE:
NO WATER STRUCK

T.L.D.



84



85

P Slide No. 2 As above, at main lake crossing, looking north east up the length of Pidinga Lake. (See Plate II).

P Slide No. 3 Taken at Island outcrop (See Plate III).

SEVEN MILE SWAMPS AREA

S Slide No. 1 Taken from Base Camp looking eastward toward Trench areas (See Plate V).

S Slide No. 2 Trench No. 1 looking toward Trench No. 2 (in the distance). Note pits and their lithologies. Also note pattern on lake bed. (See Plate V).

S Slide No. 3 Trench No. 2 looking along strike of sandstone beds in outcrop. Note pattern on lake bed (See Plate V).

S Slide No. 4 Trench No. 2 looking away from Trench No. 1 toward bank. Note pattern in lake bed (outcrops of radioactive sandstone) and general topography (See Plate V).

S Slide No. 5 Trench No. 2 close-up. Dip is to right toward Trench No. 1. Note: Hammer indicates area of black to yellow-green minerals occurrence.