DEPARTMENT OF MINES SOUTH AUSTRALIA

NOTES ON MINERAL ZONING IN THE AREAS ABOUT ANTRO. BIMBOURIE AND OLD BOOLCOOMATTA.

(Supplementary to Report of 8/12/54, S.R. 11/2/70).

The area considered in this report covers 260 square miles of the Archean province east and north-east of Crocker Well, where the field prospecting party has mainly operated during this year. A wide range of mineral occurrences have been discovered which show a similar zonal distribution - but generally sparser uranium mineralisation - as that found in the Crocker Well area.

The zoning of minerals in the area under review differs from that in the Crocker Well area (see previous report of 8/12/54) in the following details:-

- 1. Zone I does not contain thorite orangeite.
- 2. Zone II contains in addition relatively abundant beryl, tantalite, colombite and the rare phosphates graftonite, triplite, wagnerite and florencite, all of which have been observed occurring with uraninite, absite, or secondary uranium ochres.
- 3. Zone IV carries barytes. Cobalt is similarly found in this environment at the Bimba Mines.
- difficult to define, due to a more gradational relation of the granite, migmatite and metasediments, and to the marked habit of uranium and other mineralisation to be localised along epidote quartzite metasediments showing various stages of metamorphism and metasomatism. In the area south of Binberrie Hill, mineralised epidote quartzites can be traced into grey laminated siltstones and thin bedded iron formations. Ores of copper tend to follow the "Epidote Quartzite horizon", ores of tungsten, and barytes are

confined to it, and most uraniferous pegmatites with minerals of Zone II also tend to follow it. Only in the case of ores of thorium, cerium and yttrium, is mineralisation localised in gneissic granites, with accessory magnetite of "Camel's Hump" type, and not in epidote quartzite. The mobile red granites with two micas, and very little plagioclase, of the Binberrie Hill type, do not show much uranium mineralisation.

Only near Outalpa Springs is good zonation shown, where Zone I, II and III are present in concentric arcs about a centre of granitisation buried under tillites to the west. Here too, the uranium minerals of Zones II and III are confined to thin pegmatites in the grey quartzites of the epidote quartzite horizon. Also, east of Ameroo Hill, and south-east of Old Boolcoomatta, at Emery's Hill, Zone I is fairly definite in gneissic granites, but elsewhere, Zones II, III and IV are closely intermingled.

Addendum to previous report:

It has recently been brought to my notice that chalcopyrites occur in ore, with davidite, in the shaft at Victoria Hut Mine. It also occurs in D.D. cores in davidite bearing rocks at Jaggedy Rocks, Glenorchy. To this extent, at least, Zone III is overlapped by Zone IV, and zonal overlap is complete. A single occurrence of beryl, east of Weeroopie Hill, should also be noted as a Zone II occurrence, as well as recent absite discoveries at Loc. AB 6, west of Glenorchy.

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BRIEF DETAILS OF MINERAL OCCURRENCES IN THE OUTALPA-BIMBOWRIE-OLD BOOLCOOMATA DISTRICT REFERENCE Quarry on feldspar pegmatite with beryl, graftonic and blue 59 Scheelite grains in coarse garnet-articolite skirn. Proterozoic Tillites and States of the Sturtian Series. 60 Pagmatite with uranophane and ilmenite cutting epidate quartzite. Small quarry on feldspar pegmatite with beryl and columbite. Pegmotite with few small beryls. 61 Shafts on copper-bearing shear with weakly radioactive jasper. Pegmatite with few coorse beryls. 62 Davidite clot in quartz in granitised quartzite. MINERAL DEPOSITS Permatite with few small benits. 63 Detrital scheelite grains in garnet-actinalite starn area. Quarry in feldspor pegmatite with beryls and rare fremontite. Davidite clots in quartz reins in epidote quartzite, near corundum Pegmatite containing few coarse beryls. Davidite clots in quartz reins in epidote quartzite, near considum Quarry in feldspar pegmatite with few small beryls. Quarry in feldspar pegmatite with beryl, samarskile and blue aparile MINERALS Complex pegmatitic minerals 66 Uranophane in biotite streak in hybrid gneiss. (Broeggerite . Gummite , Samarskite)_____ 🔷 Uranophane in brecciated migmatite. Secondary Minerals Pegmatite with few loose bery's. (Uranophane, Autunite, Torbernite, etc.)_____ 68 Well formed xenotime prisms in small pegmatite in gneiss. Quarry in feldspar pegmatite with peryl, pyrite and turquoise. 69 Coarse orthite and rutils in aplite band. Coarse pegmatite with beryl and green apatite. Coarse orthic with magnetite in quartz pegmatite. Monazite, Orthite, Xenotime and Ilmenorutile..... Pezmatite with small beryls, garnet and triplite intergrawn with Malachite stained bacytes in beamstites. Pegmatrie with small radial beryl clusters. Malachite vein in ebidore auartzite. COPPER Chalcopyrite, Chrysocolla, Cuprite and GOLD ORES occasionally Gold _____ Quarry in pegmatite with brogggerite, autunite, beryl and Wagnerite in quartz pegmatite. Triplite and graftonite in pegmatite. 5cheelite ▼ Quartz pegmatite with few course loose beryls, 75 Malachite stains in epicate quartzite. Pegmatite with few small beryls and groins of tantalite. Malachite in joints in granitised quartzite, LEAD ORES Galena _ _ _ Pb. C3 18 Trench on pegmatite containing beryl and graftonite. 77 Chiastolites in hornfels. C3 19 Permatite with urasophane and Wagnerite. 78 Andalusite masses in scient, (Productive). Pegmottle with few large beryls and a radioactive mineral. 79 Andalusite masses between schist and quartz pegmatites. Pegmatite with uranophone, boyl, Wagrerite and coarse trip-90 Andalusite masses between schists and quartz pegmatites. BERYLLIUM ORE Beryl + 81 Monazite and crytolite in black sand layer in granitised quartzite. Quarry in feldspar pegmante with large teryls. FELDSPAR Perthite Microcline____ 82 Fine ilmenite crystals in quartz pegmatite. Pegmatite with coarse beryls and uranophane stains. Apatite and lesser Wagnerite, Triplite, Grafionite and Florencite 83 Magnesite loyers in talc-schist, Pegmatite with coarse beryl, uranophone and Wagnerite. 84 Wagnerite in quartz pezmatite. Pegmatite with coarse radiating beryl. Coarse ilmenorutile 85 Chalcopyrite grains in malachite-stained shear zone in gneiss. BARYTES with disseminated Martite ______ Bo. 86 Malachite and azurite in shear at old copper prine. Pegmatite with a few small beryls and melachite stains. ANDALUSITE - SILLIMANITE - CHIASTOLITE - (REFRACTORIES) _____ Sm. 87 Few baryls in permatite Pegmatus with a few small becals Pegmatite with florencite, specks of gummite and few baryls. 88 Few beryls in small quarry on feldspar pegmalite CORUNDUM _____Em. 89 Malachite in shear zone in gneiss. Very coarse davidite in quartz in granitised quartzine. 90 Bed of barytes-quartz-magnetite rock. TALC .____ Tc. 83 30 Permatite with a little davidite. Pegmatics with manazite grains, much magnetite and uranium 91 Bed of barytes-quartz-magnetite rock. MAGNESITE ______Mg. 92 Tarbernite scales in joints in gneiss. Well crystallised xenotime weothered out of pegmatite. 93 Pegmatite with much mica. 33 Uranophone stoins in joints cutting red gronite. 94 Bed of talc-schist. Uranophone steins in joint cutting red granite. 95 Samarskite and ilmenorable in pegmatite. Pegmatite with orthite and blue aligaclase in amphibolite. 96 Davidite in quartz veins in jointed grey laminoted quartzite. Copper carbonate and epidesmine in joints in amphibilite. Mineral locality numbers of the Outalpa Series ______5 97 Malachite in shear zone cutting gness. Gneiss containing grains of orthite, magnetite and fluorite. Mise workings _ _ _ _ ← 98 Hemanorutile in quartz pegmatite. C4 38 Bed of bended barytes-quartz-magnetite rock. 99 Quarry on feldspar pegmatite. Gealogical boundaries C4 39 Manazite grains in biotite clots in hybrid gneiss. 100 Davidite found on surface. A3 40 Few fragments of davidite shed from quartz seams. IOI Sdirmante lenses in mica schist (productive). Creeks _____ A3 41 Coarse pegmatite containing minazite, xerotime and ilmenoru-102 Sillimanite lesses in mica schrst (productive), 103 Sillimanite lesses in schist (formerly productive). A3 42 Fine grained pegmetite containing grains of manazite and 104 Bedded black iron are in Adelaide system rocks. 83 43 Clar of davidite in quartz scam in grey laminated quartzite. 105 Altered Chiagalites in graphitic schist. BB 44 Clots of davidite in quartz seams in grey laminated quartzite. 106 Burytes, 6ft. wide with Magnetite grains, near copper mire. A3 45 Clots of davidite in precurated grey faminated quartitle. 107 Andalusite in schist (formerly productive). 108 Corundum lying on surface. 43 46 Clots of dovidite in quartz seams in grey luminated quartzite. Beryl in pegmatite in staurolite lourmaline schist (formerly productive) C4 47 Bed of barvies-quarty-magnetite with chalcopyrite grans. C4 48 Manazite and magnetite in biotite streaks in hybrid giesss. 110 Bery! in pegmatites. C4 49 Gneissic granitised sandstone with crumpled heavy sand layer. Tontalum minerals reported in pegmatite. D4 50 Uranophane stains in red discolaired granite. Iren are in Adelaide System racks. D4 51 Uranophase in pegmatite. Feldspar in pegmatite (productive). D3 52 Uranophose stains in pegmatite cutting epidote quartate. PLATE V -- MINERAL MAP OF THE OUTALPA ---E3 53 Uranophase stains in patches in large irregular pegmetite. 115 Good Foldspar in pegmatite. E3 54 Quarry in feldspar pegmatite with bright prange gummite and BIMBOWRIE - OLD BOOLCOOMATA AREA 116 Beryl in pegmante. E4 SS Scheelite, detrital grains, in garnet-actinolite skarn area. 117 Beryl in quartz-mica pegmatine. 116 Andalusite at contact of ichist and quartz-pegmatite. E4 56 Pegmatite carrying intergrowth of triplite and graftonee. E3 57 Davidite class in pegmatite cutting grey flaggy quartities. 119 Pair glade gritty graphitic mica-schist. Compiled by D. King Geologist E3 58 Shaft on quartz red with capper ares. Alluvial gold found 120 Corundum, in biotite-plugioclase gneiss. and J. Johnson Technical Assistant S.A. Department of Mines

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