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JUNCTION COAL PTY LTD

EXECUTIVE SUMMARY

Junction Coal Pty Ltd holds exploration tenure EL/2015. Exploration and evaluation since grant has centred on areas in and around the historical Stanhope, Fenhope, Mt Christie, and Bonneys Plains coal mines north and west of the Avoca township in the Midlands region of Tasmania.

No fieldwork was carried out during Year 4 due to funding issues, however, during the reporting period the company applied for and was granted collaborative exploration funding (EDGI) from the Mineral Resources Tasmania. A public presentation was given at the AusIMM Tasmanian Geoscience Forum in Smithtown on work completed to date.

Modelling work continued and the planning for the 2019 drilling program for which the EDGI grant was afforded was completed. It was recommended from this work that future exploration should also include a modest large diameter core program to test float/sink washability and coking properties of the main target seams (Stanhope or Beta, and Delta) at the Mt Christie and Bonney's Plains localities.

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INTRODUCTION

EL1/2015 was granted to Junction Coal Pty Ltd on the 23rd April 2015 for a period of five (5) years (**Table 1**). Junction Coal Pty Ltd is a privately-owned company which holds 100% share of the tenement. EL1/2015, known as the Avoca West Coal Project, lies to the north-west of the township of Avoca (**Figure 1**) whilst the larger centre of Campbell Town straddles the south-western EL boundary. The tenure covers an area of 82km^2 (**Figure 2**).

Junction Coal Pty Ltd's original objectives for EL1/2015 Avoca West are to post a maiden Indicated and Inferred Resources to the 2012 JORC Code and to obtain large diameter core information to allow detailed float/sink washability testing to be conducted. Historical drilling around the Avoca region has defined a known area of coal seams and has provided some basic data on coal quality. Previous exploration was sporadic with disparate databases created by explorers. The priority task was to combine all data into a standard coal mine planning database and produce a coherent regional structural model of the coal-bearing strata and the coal seams.

Table 1: Tenure Details

Tenure	Status	Principal Holder	Grant Date	Expiry Date	Size (km^2)	Category
EL1/2015	Granted	Junction Coal Pty Ltd	23-APR-2015	22-APR-2020	82	2. Fuel Minerals

The township of Avoca lies to the south-east of the tenement while the larger centre of Campbell Town straddles the south-western EL boundary. A 1,067mm gauge railway used only for freight purposes links the licence area with Hobart and the north coast centres of Bell Bay, Devonport and Burnie.

A network of mainly unsealed roads and numerous logging and farm roads provide reasonable access to most of the licence area. Access for drilling equipment to specific sites generally requires the construction of new roads, the maintenance of which has been reported as difficult during periods of heavy rainfall.

The topography of the EL is dominated by an extensive plateau with an average elevation of 650m above sea level. River valleys, generally bounded by steep scarps, have been incised to elevations of 100- 200m above sea level. The basic topographic form of the area reflects the widespread occurrence of thick hard dolerite cover which has been removed only where there has been strong and persistent fluvial erosion. The coal-bearing sequence appears to have been eroded along the watercourses of Buffalo Brook and Hercules Creek. Buffalo Brook flows from the centre of the project area towards the south.

The temperature and rainfall are significantly influenced by the local topography. In the valleys rain falls on approximately 100 days per year, but on the plateau, there are about twice as many rainfall days. Almost all rainfalls during the months May to November, the highest rain fall being during July and August. Average winter temperatures range from -5°C to 5°C, and snow-falls are common above 600m from June to August.

Combined with rugged topography, the high rainfall increases the difficulty and cost of exploration operations during the winter months. Access can be maintained much more economically during summer and whenever practicable drilling is confined to the November to May period.

Figure 1: Location of EL1/2015

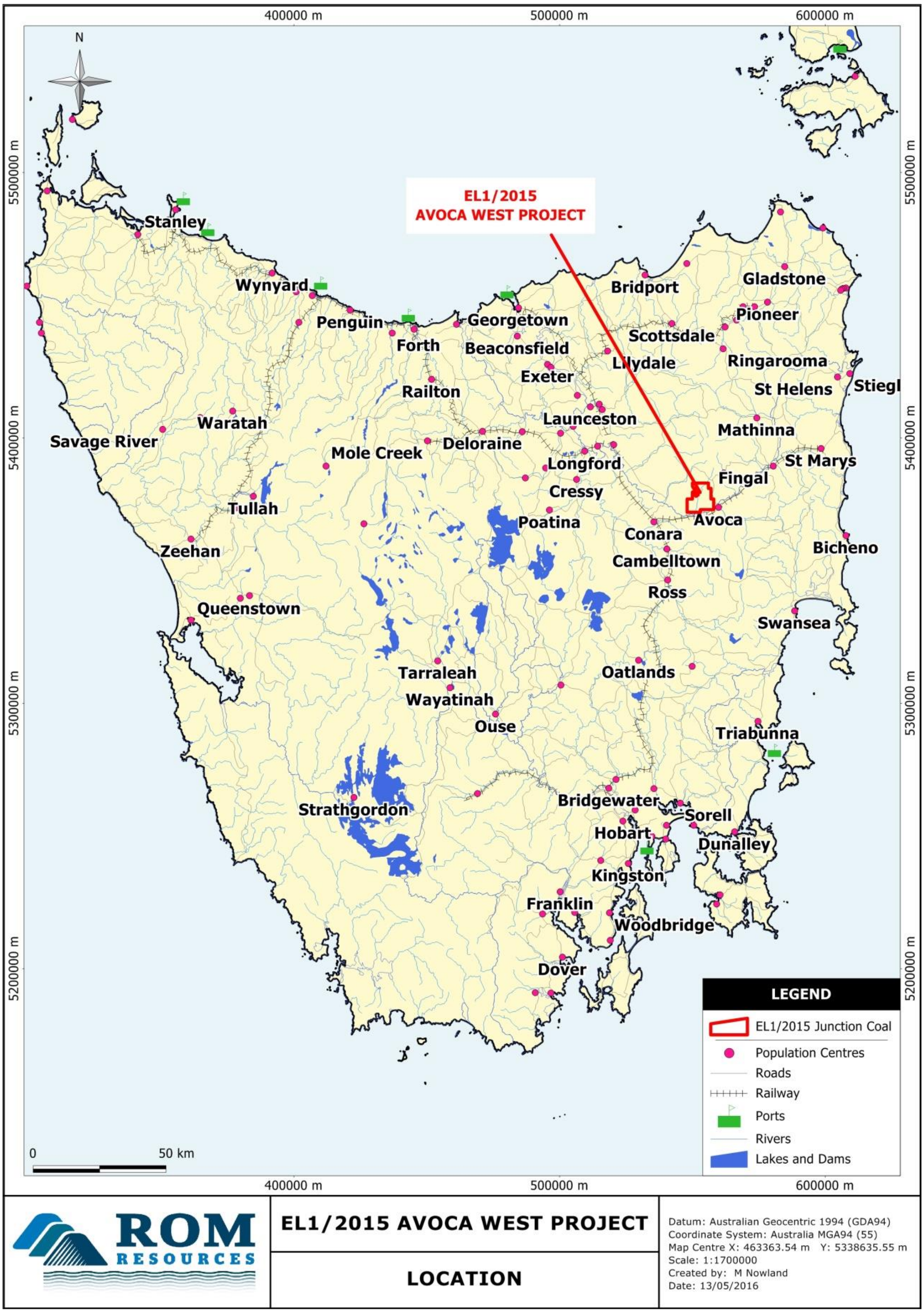
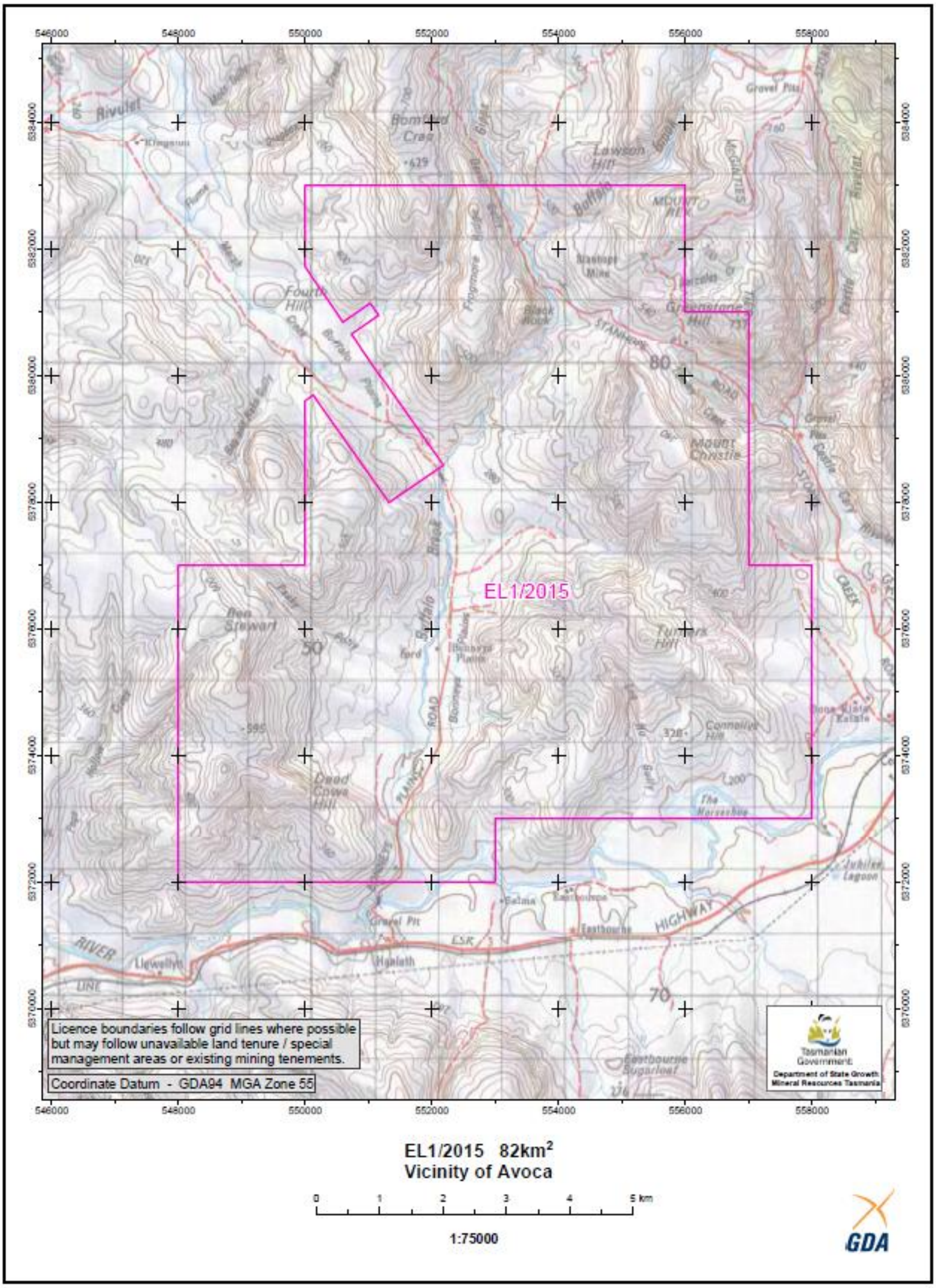


Figure 2: EL1/2015 Tenement



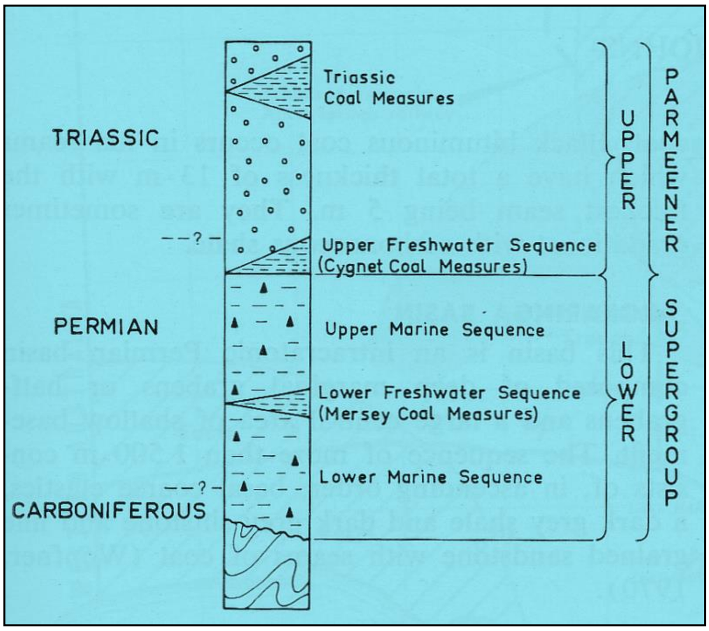
(Mineral Resources Tasmania, 2015)

Regional Geology

Regional Stratigraphy

The exploration licence is located on the north-eastern margin of the Permo-Triassic Tasmania Basin. The basin basement consists of the Lower Palaeozoic Mathinna Beds and the Devonian Age Ben Lomond Granite. A generalised stratigraphic column is shown in **Figure 3**.

Figure 3: Regional Stratigraphy of the Permo-Triassic Tasmanian Basin



Modified after (Noldart, 1975)

Parmeener Super Group

The Parmeener Super Group is divided into lower and upper sections of Permian and Triassic-age respectively. The two sections are disconformable. The Super Group contains three coal measure sequences, two occurring in the Permian section and the third within the Triassic. Within the tenure, coal seams of economic potential are restricted to the unnamed Triassic-age coal measure sequence (Water, 1978), and are currently mined at Mt Nicholas by the Cornwall Coal Company Pty Ltd.

Lower Parmeener Super Group

The Lower Parmeener Super Group unconformably overlies the Silurian Mathinna Beds. No complete exposed section is present within the tenure.

The basal unit Cascades Group comprises a sequence of mudstone and siltstone overlain by limestone. The lower mudstone/siltstone unit is up to 40 metres thick and is often fossiliferous. The limestone is usually highly fossiliferous and ranges in thickness from 10-50 metres.

The Ferntree Group appears to conformably overlie the Cascades Group, although no contact was found outcropping within the tenure. The Ferntree Group comprises the Risdon Sandstone in the lower section and a dark grey silty mudstone-siltstone with occasional quartz grains and pebbles in the upper section. The Risdon Sandstone was not recognized in outcrop. The upper mudstone-siltstone unit ranges in thickness from 25-50 metres. No marine or plant fossils were found within this group (Water, 1978).

Upper Parmeener Super Group

Various sub-divisions of the Triassic sequence have been proposed since Hills et al, (1922) but are now considered obsolete (Bacon, 1991). Thus, the Triassic is now referred to as the Upper Parmeener Super Group with no further sub-division. Locally the coal measure sequence within the EL has been informally named the Avoca Coal Measures (Morrison, 1998), but no formal stratigraphic definition has been published.

Outcrop of the coal measures in the valley floors and upper valley slopes is generally poor, due to alluvium and dolerite scree. However, good exposures of the coal measures and coal seams commonly occur within the various creek beds.

The Avoca Coal Measures sequence consists of quartz sandstone with interbedded mudstone, siltstone and rare coal in the lower section, the feldspathic lithic sandstone with interbedded mudstone, siltstone, carbonaceous mudstone and coal in the upper section.

Surface mapping by previous explorers and logging information from Mines Department boreholes within the tenure area indicate that the thickest coal seams occur within the upper 200 metres of the coal measures, and that the lower 100 metre thick quartz sandstone (locally the Ross Sandstone) section is usually barren of coal. The Ross Sandstone in the lower section of the coal measures appear too thin to the east. In some parts of the area a thin pebble conglomerate/ granular conglomerate occurs at the base of the Triassic.

Cainozoic

Tertiary

No Tertiary-age sedimentary rocks or basalt have been identified within the licence area (Bacon, 1986).

Quaternary

Quaternary sediments are common within the licence and comprise alluvium on the South Esk River Valley floor and dolerite scree on the valley slopes and plateaus.

The alluvium consists of silt and sand on the valley floors and swampy loam in the marshes on the plateaus. In the broader sections of the South Esk River Valleys the alluvium is believed to be up to 85m thick.

Dolerite scree is common along the edges of the tiers and valley slopes. The scree ranges in size, from particles, up to blocks in excess of 10m in diameter. The abundance of dolerite scree on the slopes and in creek beds masks the dolerite/sedimentary contacts and complicates mapping and location of coal seams. In some creek beds exposed weathered dolerite scree is similar in appearance to weathered lithic sandstone. Thickness of the dolerite scree appears to vary from a thin veneer up to an estimated thickness of 40m on the northern slopes of Mount Christie (Pemberton, 2013).

Igneous Rocks

Devonian Granite

The Upper Devonian age Ben Lomond granite intrudes the Mathinna Beds in the vicinity of Ben Lomond mineral field. The granite occurs in outcrop as low rounded hills and appears to have had some residual relief when the Permian age Lower Parmeener Super Group was being deposited. Tin mineralisation was associated with the intrusion of the granite and many tin, tungsten and uranium mines have operated near Mt Rex and Ben Lomond (Blissett, 1959).

Jurassic Dolerite

The dolerite is of Upper Jurassic age and intrudes the Parmeener Super Group as a complex of sills, transgressive sheets, and dykes. Within the tenement the dolerite usually intrudes the Upper Parmeener Super Group. North of Fingal the dolerite has been reported by Threader (1968) to intrude the Lower Palaeozoic Mathinna Beds. Dolerite outcrops over approximately 70% of licence area as plateau areas, due to its widespread intrusion and general resistance to weathering and erosion.

The dolerite sills range in thickness from 2m in Buffalo Creek up to 307m intersected in Shell borehole hole AV13. The sills generally appear to have a thickness in excess of 200 m, especially the main 'upper sill' which forms the Mt. Foster-Fingal plateau. This 'upper sill' which has been exposed by erosion and caps the plateau, appears to be many abutting sills formed from separate feeders.

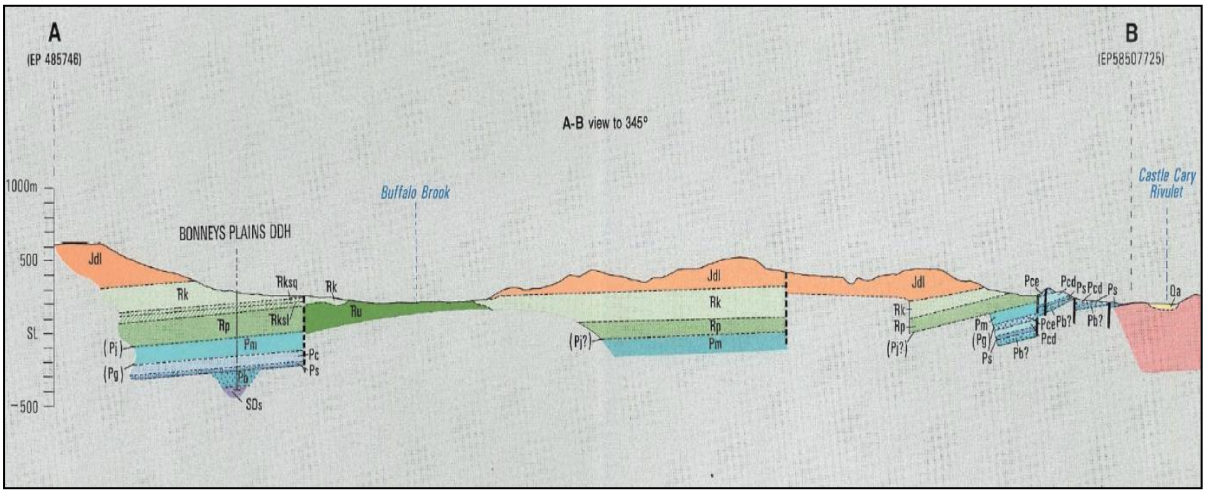
Structure

The dolerite sill capping the Ben Lomond Plateau, to the north of the Stanhope area, is at least 330m thick (Blissett 1959). The dolerite has intruded as a series of dykes and transgressive sheets, with minor faulting accompanying the intrusion.

Both minor and major faulting occurs within the area, though the full extent of faulting is masked by the extensive Jurassic-age dolerite sills and Quaternary dolerite scree (see regional cross-section in **Figure 4**). Faulting within the tenement appears to have been associated with the intrusion of the Jurassic dolerite and Early Tertiary block movements Major faults developed during the Tertiary with the largest fault being the NW-trending Castle Carey Fault, which may be traced for about sixteen (16) kilometres (Blissett, 1959). These faults have caused the formation of several horst and graben structures, which form the basis of the present-day topography (Blissett, 1959). To the south of the Stanhope-Mount Christie area the overall faulting pattern seems to consist of a series of step-faults to the south-east (Taylor, 1979).

The general dip and strike of the strata is variable 5-25° to the southwest, with strike to the north-northwest. Mine workings have reported some seam rolls, but these don't appear to have developed into large-scale folding. The dominant structural feature of the tenure is the Tertiaryaged Castle Carey Fault, which is upthrown 600-800m to the east. Mine workings have intersected many smaller mostly normal faults with throws ranging between 1-25m, but with a spread of trends. These faults are often calcite-infilled and slickensided and are reported to have disrupted mining on numerous occasions (Bacon, 1991). Work is progressing on capturing all the regional and mine-scale faulting, as no single coherent plan showing fault patterns in the area has been previously produced.

Figure 4: Section A-B from Snowhill 1:50,000 sheet map

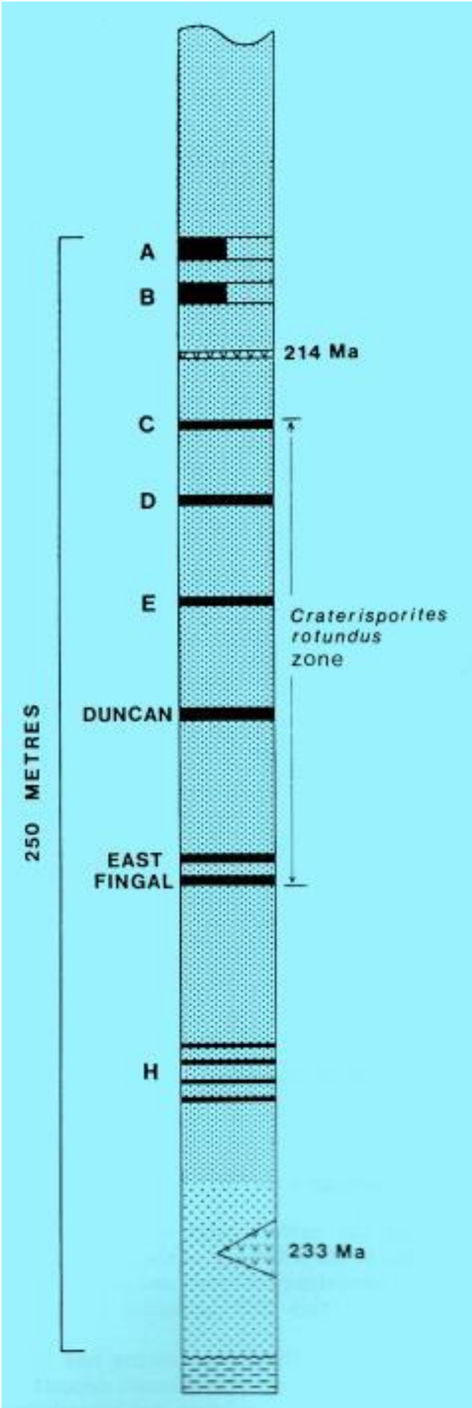


Modified after (Gulline, Forsyth, Everard, Calver, & Matthews, 1991)

Local Geology

In the Avoca-Fingal-Mt Nicholas coalfields, there are eight (8) major seams identified by previous explorers. Correlation of coal seams is difficult, as they are discontinuous or lenticular in character, often with numerous stone bands and varying seam thickness over several hundred metres (Morrison and Bacon, 1986). **Figure 5** shows a generalised section of the coal intersections in the Fingal Tier area. An analysis of the potential of the coal deposit hosted in each of the seams has been tabulated along with historical nomenclature (**Table 2**), largely taken from Threader and Bacon (1983).

Figure 5: Generalised Stratigraphic Column - Fingal Tier Area



Modified after (Morrison & Bacon, 1986)

Table 2: Classification of Seam Intervals

INTERVALS	HISTORICAL NAMES	DESCRIPTION
Seam A	Alpha	This seam is generally thin; 1-3m of interbedded dull coal and carbonaceous mudstone, non-carbonaceous mudstone, and claystone in bands ranging from a few centimetres to 0.5 - 1m thick. There are no working sections in any of the Seam 'A' intervals sampled by the Department of Mines. A working section at the time that the Mines Department exploration occurred was defined as an interval of coal greater than 1.5 m thick with an ash content of less than 40%.
Seam B	Beta/ Stanhope/ New Stanhope	This seam is an interbedded coal / non-coal sequence similar to but thicker than seam 'A'. It is typically a 1-5m thick coal seam variously banded. Examination of the graphic logs of the coal seam intersection clearly shows the interbedded nature of the seam. Whilst at Fingal there are very few working sections or possible working section in seam 'B', it has generally been reported (Bacon, 1991) that the Stanhope Seam is a correlative of the 'B' / Beta seam. This was the seam mined underground at Old and New Stanhope, Fenhope and Mt Christie Collieries.
Seam C	Gamma	This seam has many interbedded mudstone and claystone bands and is commonly 0.5-3m thick, with thicker sections common. Seam 'C' is particularly well-developed along the front of the Fingal Tier east of the Mitchell Fault. Unfortunately, these coaly intervals of great thickness contain no working sections in seam 'C', although this seam was worked at Mt Christie and Merrywood Open-cut.
Seam D	Delta	Seam D is commonly 1-2m thick, with only a few mudstone and claystone bands. Generally, the ash content ranges from 25 - 35%, but there is only a few working sections due to the thickness of the seam. This seam has been worked at Mt Christie and may have some limited coking potential.
Seam E	Eta	Seam E is most commonly one metre thick and many holes are represented by a mudstone horizon. There are no working sections in seam 'E' in the holes drilled by the Government.
Seam F	Duncan Seam/ Theta	This is the main target coal seam of the Fingal Mt Nicholson Coalfields, and has been extensively worked in the area. Typically, the seam consists of 2 -3m of dull coal with minor clay and mudstone partings. The raw ash content is approximately 30% and the Specific Energy approximately 22-24 MJ/kg. It is poorly represented at Avoca West.
Seam G	The East Fingal Seam/ Iota	The East Fingal Seam is like the Duncan seam but in most of the borehole intersections was found to be split into two seams with a varying interburden. Both the upper and the lower split are 1-2m thick each. This seam is moderately developed at Avoca.
Seam H	Kappa	Seam H is commonly split into two thin seams, each usually less than one metre thick. The seam is only poorly developed, being represented by a mudstone bed in at least half the holes drilled. Coal seams like this were logged in DOM Bonneys Plains 1

Coal Quality

Coal from all economic seams in the area could be regarded as a high volatile bituminous steaming coal with medium to high inherent ash and low sulphur (Bacon, 1983) and (Patterson & Ward, 1982).

The variation in specific energies observed is largely due to ash and moisture content variation. A linear regression of all Mt. Nicholas-Fingal Coalfields specific energy and ash/moisture data gives the following air-dried (ad) specific energy to air-dried (ad) ash/moisture relationship:

Specific Energy (MJ/kg) = 31. 49 - 0.33 (Ash + Moisture)

The relationship appears to hold well for both washed and raw coals, with an overall correlation coefficient of 0.96. In general Triassic Tasmanian coals have a moderately-low specific energy relative to their rank and ash. This characteristic, results from the very high proportion of inertinite which the coals contain, inertinite having a lower specific energy than vitrinite or liptinite (Patterson & Ward, 1982). In the Avoca West area, coal has an inherent ash content of 15-25%, indicating a steady influx of clastic material into the peat swamps during formation. The high inertinite composition of Tasmanian coals can be explained by frequent drying and partial oxidation of peat deposits (Morrison and Bacon, 1986).

Dolerite intrusions can increase the rank in parts of the Tasmanian coal fields. In some cases, the mean maximum vitrinite reflectance has been increased from ~0.57% up to 3.6% (Morrison and Bacon, 1986).

Twelvetrees (1906) and Hills et al (1922) reported that the “D” seam at Mt Christie had adequate coking properties but did not list laboratory analysis. One (1) stockpile sample by Western Mining reported a CSN of 6.0, whereas most of the Stanhope seam reports CSN’s of 0 to 1.5.

REVIEW OF PREVIOUS WORK

Previous Investigations

Mining History

Bacon (1983) summarises the early discovery of coal in the area to the north of Avoca as follows:

Coal was noted as early as 1882 north of Avoca, when Mr R. Stevenson drove a tunnel into a coal seam on Storys Creek four kilometres from the Storeys Creek tin mine. Montgomery (1892) wrote of coal discoveries in the Avoca district and Waller (1901) mentioned coal outcrops in Gipps Creek and on the south-eastern flank of Ben Lomond. James Stevenson found coal near Mount Christie in 1904 and Twelvetrees (1906) reported at length on the Mount Christie and Buena Vista seams. Twelvetrees found three tunnels (one partly collapsed) on the southern flank of Greenstone Hill. The uppermost tunnel had been driven in a north-west direction for 15m on a 1.8-2.1m thick seam of coal. A second (collapsed) tunnel was 33m lower in elevation than the first and had intersected 3.6m of coal. Twelvetrees (1906) and Hills et al. (1922) thought the exposed seam in both the upper and lower tunnels was the same, repositioned by faulting. These workings, together with many subsequent adits in the same area, became known as the Mt Christie mine.

Twelvetrees (1906) reports, that in 1905, one shaft had been sunk on the area of flat ground between Mount Christie and Greenstone Hill. By 1922, five shafts had been dug on the flat, and three exploratory adits had been dug into the slopes of Mount Christie and were called the 'Buena Vista' mine by Hills et al. (1922). These workings became the site of the Stanhope mine (Pemberton, 2013).

Stanhope (Excelsior) Mine

The Excelsior mine was small, producing 93 tonnes per annum by 1929. Bacon (1983) notes that the mine was renamed the Stanhope in 1931 and the workings moved eastwards. Seam conditions were difficult due to extensive faulting and some seam thinning.

The new workings at the (old) Stanhope were accessed in 1937 by a drive on the southern side of a fault. Coal was mainly mined by the bord and pillar method with a brief attempt at a short wall face (1943) and the long wall (1947) technique. Bacon (1983) notes that collapse of the long wall face resulted in a dramatic decrease in output and reversion back to the more suitable bord and pillar method of mining.

Mining was made difficult by numerous small faults. Threader (1968) attempted to compile a report on the diamond drilling by the mining company at the Stanhope colliery over the previous 19 years. Records of core logging were incomplete and locations of holes uncertain. The main drive of the New Stanhope was started in 1956 and operations finally ceased at the Stanhope in June 1957. Bacon (1983) reports that the total production from 1932 to 1957 was approximately 175 000 tonnes (Pemberton, 2013).

New Stanhope Mine

The New Stanhope Mine is 1.3km north-west of the Stanhope mine. A drilling program undertaken by the Department of Mines for the Mine Management provided some geological control for mine planning at the New Stanhope. Drill holes 13 through to 17 had good seam intersections. A detailed description of the New Stanhope geology can be found in Appendix 4 in (Bacon, 1983). Normal faulting with throws of 3m to 4m commonly crosses the workings and was one of the major setbacks which caused the mine to close (Pemberton, 2013).

Production began in 1957. Threader, (1972) concludes that on drilling evidence that the same seam (Stanhope) that had been mined at the Old Stanhope Colliery was mined, in contradiction to the commonly reported belief from Mine Management that they were different seams. The seam was 2.1 m thick and mined from two (2) adits. The No.1 adit was developed in 1957 and the No.2 adit in 1963. Development continued until 1969 when complex geological structure and poor roof conditions were encountered. Pillar extraction continued until 1973 when the mine was closed (Pemberton, 2013). Total production from 1957 to 1973 was approximately 220,000 tonnes (Bacon, 1983). Average analysis for run of mine coal from the New Stanhope is documented in **Table 3** below:

Table 3: Average Analysis for ROM Coal (Stanhope Seam) at the New Stanhope Mine

Coal Quality Variable	Amount
Moisture (%)	7-9
Ash (run of mine) (%)	25
Ash (washed coal) (%)	14-18
Volatile carbonaceous matter (%)	33
Fixed carbon (%)	35
Specific Energy (MJ/kg)	25.28

Mount Christie Mine

The Mt Christie workings are seen on the southern flank of Greenstone Hill. Bacon (1983), reports that in 1927 a few tonnes of coal were produced from the old workings and again in 1940, producing sixty-five (65) tonnes in that year. In 1959 a new tunnel was worked until 1965 by N and D Fenton, who produced 1,700-1,800 tonnes of coal per year. The workings closed in 1965 with production estimated at 13,000 tonnes (Bacon, 1991) (Pemberton, 2013).

Fenhope Mine

In 1981 Mr D. Fenton opened the Fenhope (ML 1008 P/M) to the north of the old workings of the (old) Stanhope Mine. Bacon (1983) notes that the seam mined was the Stanhope seam which was 3.6m thick with a 0.45m dirt band in the middle. Estimated production from the Fenhope to 1983 was less than 1,000 tonnes (Pemberton, 2013).

Stanhope Open Cut

The Golder Report (2012) includes unreferenced information on the mining of the Stanhope Open Cut. In 1997 the Merrywood Coal Company was granted Mining Lease 1640P/M. A small open cut mine was developed over the Stanhope mine underground workings progressing downdip. The mine closed in December 1998. The estimated coal production was 175,524 tonnes and washed coal product was 121,917 tonnes at an average recovery of 69.5%. Bacon, 1983, and Pemberton, (2013) mentioned that the Stanhope seam was on fire. In total, the Stanhope Coalfield produced 584,524 tonnes from approximately 1905 to 1998 (Pemberton, 2013). **Table 4** below summarises the production from each mine.

Table 4: Total Production of Coal for Avoca Coalfield

Mine	Tonnes
Old (New) Stanhope	175,000
New Stanhope	220,000
Mt Christie	13,000
Fenhope	1,000
Stanhope Open Cut	175,524
Total	**584,524**

Recent Exploration

Western Mining Corporation (Tasmania) Pty Ltd (WMC)

EL 16/76 was granted to WMC in August 1976. The EL covered 826 sq km in the Stanhope – Bonneys Plain area. WMC were exploring for shallow open-cut coal. Regional exploration for Triassic sediments with coal measures identified the Bonneys Plains area as a prospective target. Nine (9) open holes were drilled to the west of the Stanhope area on Bonneys and Buffalo Plains. The holes were short (80m to 82m) and the total length drilled was 587.3m (**Table 5**). Four (4) holes (TAR 1, TAR 2, TAR 3, and TAR 8) intersected minor coal seams. The lithic sandstone facies were intersected in seven (7) of the holes. The thickest intersection of coal measures was in TAR 2 with 45cm comprising thin seams and carbonaceous shale (Pemberton, 2013). Results of the coal quality analyses from TAR 2 chips have been tabled below (**Table 6**):

Table 5: Western Mining Corporation Boreholes

Hole No.	Hole Type	Total Depth (m)	Comments
TAR 1	Open hole & core	82.00	Coal measures at approx 3.5m.
TAR 2	Open hole	84.90	Coal measures at approx 45m.
TAR 3	Open hole	63.50	Dolerite to 7m. Coal measures at approx 32.5m.
TAR 4	Open hole	60.00	No coal intersected.
TAR 5	Open hole	78.00	No coal intersected.
TAR 6	Open hole	3.80	Hole abandoned in dolerite.
TAR 7	Open hole	60.00	No coal intersected.
TAR 8	Open hole	80.00	Coal measures from approx. 5.2m.
TAR 9	Open hole	78.00	No coal intersected.

Table 6: Coal Quality Results for TAR2, Bonnys Plains

From Depth (m)	To Depth (m)	Thick (m)	Inherent Moisture (% adb)	Ash (% adb)	Volatile Matter (% adb)	Fixed Carbon (% adb)	Crucible Swell Number
10.0	10.4	0.4	2.5	36.9	19.9	40.7	0.5
11.0	11.4	0.4	2.5	29.1	25.6	43.8	0.5
14.1	14.5	0.4	2.5	52.1	19.1	26.3	0.5
38.8	39.0	0.2	2.5	29.5	32.6	35.4	0.5
47.6	48.0	0.4	2.5	71.1	11.9	14.5	-
48.0	49.0	1.0	2.5	80.3	10.3	6.9	-
49.0	49.5	0.5	2.5	86.0	8.2	3.3	-

In the area covered by the TAR drilling program WMC concluded that the dolerite had transgressed the Triassic sequence close to the base of the coal measures. It was suggested that it could be that the dolerite edges are faulted and that all boreholes were drilled in the uplifted block where the coal measures had been removed. This would mean that the coal measures could still be preserved beneath the dolerite. No further work was undertaken, and the ground was not renewed in 1977 (Pemberton, 2013).

Shell Company of Australia Limited (Shell)

Shell was granted EL 18/77 covering 1,473 sq km in January 1978. Shell completed a regional review using aerial photographs, constructed a regional geology map, did a fracture study of the area and a follow up field mapping programme was conducted (Bornman, 1981) (Bornman & Murphy, 1981).

Shell drilled two holes west and south of Stanhope in 1980. Both holes were drilled through the dolerite. AV12 was drilled near Turners Hill and AV13, 2km west of Bonneys Plains.

Hole AV12 intersected 158.73m of dolerite, 324.61m of Upper Parmeener Super-group and 6.99m of Lower Parmeener Super-Group. Hole AV13 intersected 307.46m of dolerite, 52.24m of the lower section of the Upper Pameener Super-Group sequence. No significant coal seams were present in the holes. Shell relinquished the licence in July 1981 (Pemberton, 2013).

Avoca Transport Company Pty Ltd (Avoca)

Avoca conducted a review of the Stanhope Coalfield with the objective of identifying areas with potential for surface mining including pillars remaining in the abandoned underground workings.

Nine (9) cored holes were drilled in 1986 and 1987 in the vicinity of the Stanhope workings and one (1) hole (ATS 56) drilled immediately south of the New Stanhope workings.

It was noted that the geology of the area is complicated by the proximity to the Castle Carey fault with numerous associated faults seen in the mine workings. Dolerite has intruded the mine sequence and forms all the surrounding elevated areas.

Avoca concluded that open cut mining potential was restricted to an area bounded by boreholes ATS 52 and 57 with a fault to the west, dolerite to the south and Old Stanhope to the north. The

New Stanhope was dismissed as having little open cut potential because the pillars had been extracted and the steep topography and seam dip would limit accessible reserves.

At the New Stanhope Colliery borehole ATS 56 intersected the seam at 20.43m. It has a competent sandstone roof and is comprised of two coal plies 2.61m and 1.06m thick (Pemberton, 2013).

Merrywood Coal Company

The Merrywood Coal Company evolved from the Avoca Transport Company and was granted EL 21/91 in 1993. Two (2) open holes (MS–1 and MS–2) were drilled in the Stanhope mine area to confirm resources and MS-3 was drilled and abandoned in dolerite talus south-east of the New Stanhope mine near Hercules Creek (Morrison, 1997 and Morrison, 1998).

A 1,500-tonne bulk sample was extracted in 1997 and was processed through the Merrywood wash plant and trial burns were successfully conducted with existing Merrywood customers. The product coal was reported to have calorific value 5,490 - 6,450 kcal/kg. A programme of forty (40) air track boreholes was conducted to define the depth to the top of the main seam and locate seam fault displacements accurately. Eighteen (18) of these air track boreholes were surveyed however records are sketchy. The program also identified that an upper and lower seam that had not been previously mined was present above and below the main seam (the Stanhope). Mining Lease 1640P/M covering 249ha within the licence was granted to Merrywood in 1997 (Pemberton, 2013).

Spitfire Resources

Marston International Pty Ltd conducted an exploration drilling program on EL 27/2008 for Spitfire Resources in April and May 2010 (Fraser, 2012). Sixteen (16) open holes and two (2) cored holes were drilled for a total of 1,119.2m. None were geophysically logged.

The holes were in the general vicinity of the Stanhope and New Stanhope mines. The objective of the drilling programme was to test for extensions of known coal occurrences around the historical mines, identify additional resource in previously unexplored areas and test extensions of the seams beneath the dolerite cover.

Seven (7) open holes collared in the dolerite were abandoned due to poor ground conditions. Six open holes successfully intersected coal measures beneath dolerite cover. Four (4) of the five (5) holes on the Triassic intersected coal measures with coal seams 0.5m - 3.0m thick. Rock chip samples were taken through the coal intervals but do not appear to have been analysed

Two (2) cored holes were designed to sample the best coal intercepts located by the open hole drilling. Hole DDH001 was drilled to the north of the New Stanhope mine and intersected 2.4m of good quality coal. Hole DDH002 was drilled on the slopes of Greenstone Hill to the west of the Stanhope open cut and intersected 1.9m and 2.9m of high ash stony coal (Pemberton, 2013).

Marston International concluded (Fraser, 2012):

- The coal measures have been confirmed as present for approximately 4km along the slopes of escarpments adjacent to Gipps Creek (in EL23/2010 to the north);

- An extension of the underground resource was identified to the north of the New Fenhope mine.
- The coal measures have been removed by erosion along the courses of the local streams.
- Coal measure outcrops and seam intercepts were confirmed beneath the base of the dolerite in the area explored.
- Access to drill sites designed to test coal measures beneath significant thicknesses of dolerite was extremely difficult due to the steep terrain. Only drill sites near the margin of the dolerite could be accessed.
- Drilling through the dolerite to test the underlying coal measures is difficult and regional continuation of the seams has not been conclusively demonstrated to date.
- Seam thickness is variable, coal quality appears to deteriorate rapidly in some areas, faulting is common and seam correlation is uncertain.
- The presence of the nearby regional Castle Carey fault may have had a significant impact on structural disruption of the seams in the area.
- The steep topography dictates there is no potential to identify open cut resource in the area explored.
- The observed, reported and interpreted faulting indicates limited potential to identify extensive mineable underground resource in the area explored.
- Additional exploration potential may exist further to the west where the influence of the Castle Carey fault is diminished, where dolerite cover appears thinner and topography is less rugged.

Fraser, (2012) concluded that:

- Further exploration of the lithic and feldspathic lithic sandstone facies in areas where the dolerite is not present, mainly along creeks and surrounding flat areas, is not justified as the unit appears to have been removed by erosion.
- Further exploration around the New Stanhope mine is also not warranted due to the presence of thick overlying dolerite, the proximity to the Castle Carey Fault and deteriorated coal quality in nearby drill holes.
- The only area recognised that has not been fully explored is the Bonneys Plains area approximately 3.5km south of the New Stanhope Open cut.

At Bonneys Plains, Hills et al, (1922) reported coal measures in the workings comprising thin coal and carbonaceous shale over 2m thick. The reported quality of samples collected and analysed by Hills indicated moderate to high ash (28.7%, adb). Western Mining Company intersected thin coal seams to the east of the workings in TAR 1.

Fraser, (2012) interpreted the drill hole intercept and seam exposures in the Bonny's Plains area to represent the basal section of the coal measures and that the upper part of the sequence remains untested. A drilling program of four (4) holes to test this interpretation was proposed but the program did not eventuate, with no holes drilled (Pemberton, 2013).

EXPLORATION COMPLETED DURING THE REPORTING PERIOD

No field activity was undertaken during the Year 4 reporting period however the following was completed:

1. Application documentation for the current EDGI grant being offered by Mineral Resources Tasmania (MRT).
2. Presentation to the AusIMM Tasmanian Geoscience Forum in Smithtown of work completed to date.
3. Compilation and encoding of all available coal quality data.
4. Completion of digitising and registering to MGA zone 55 of all historical mine plans for the old and new Stanhope collieries, Fenhope colliery, undergrounds and the Stanhope open-cut.
5. Completion of digitising and registering adits and shafts associated with the Mt. Christie mine and Bonneys plains prospect.
6. Completion of digitising and registering all underground mine faults.
7. Seam correlation, modelling, and resource estimation to the 2012 JORC Code standard.
8. Planning for 2019-2020 Drilling Program (see below for more detail).

2019-2020 Drilling Program Planning

Three areas have been identified as being under explored at Stanhope and Bonney's Plain:

1. The area from the Fenhope Mine to the New Stanhope Mine is prospective with both Avoca Transport and Indicoal reporting seam intersections. Indicoal DDH002 was drilled on the slopes of Greenstone Hill to the west of the Stanhope open cut and intersected 1.9m and 2.9m of high ash stony coal. Avoca Transport reported an intersection of 2.61m and 1.06m separated by 0.25m of mudstone in ATS 56.
2. The area to the north and west of the New Stanhope is also prospective with borehole DOM_17 having a 2.1m seam intersection. Indicoal DDH001 was drilled to the north of the New Stanhope mine and intersected 2.4m of good quality coal.
3. The Bonneys Plains area around the old workings and WMC hole TAR 1 remains under explored. This was recognised by Golder who designed a four-hole program with drill sites designed to hopefully intercept the full thickness of the coal measures.

Further exploration of the lithic sandstone facies in areas where the dolerite is not present, mainly along creeks and surrounding flat areas, is not justified as the unit appears to have been removed by erosion. Further exploration to the northeast the New Stanhope mine is also not warranted due to the presence of thick overlying dolerite, the proximity to the Castle Carey Fault and deteriorated coal quality in nearby drill holes.

The only area that has not been fully explored is the Bonneys Plains area approximately 3.5 km south of the MWC Stanhope Open cut. It is 3 - 4 km distant from the Castle Carey Fault. Hills (1922) reported coal measures in the workings at the Bonneys Palins comprising thin coal and carbonaceous shale over 2 m thick. The reported quality of samples collected and analysed by Hills indicated moderate to high ash (28.7%, adb). Hills interpreted the workings to correlate with the Delta (D) Seam in the Mt. Christie area. Hole TAR1 drilled by Western Mining intersected coal measures 3.5 m thick to the east of the workings. The drill hole intercept and seam exposures in the Bonneys Plains workings to represent the basal section of the coal measures and that the upper part of the sequence remains untested.

It is proposed to test for the complete sequence by locating drill holes up sequence from these locations. This would however require drilling through 50 – 70 m of dolerite cover to intersect the coal measures and test for the presence of the thicker better-quality B Seam. Previous experience indicates there is some risk with successfully drilling through the dolerite. It is likely that any resource identified could only be exploited by underground means. The locations of the ten proposed open and partially cored holes, 2019_01 – 2019_10, are shown in **Figures 6** and **7**.

Figure 6: Location of Proposed Exploration Boreholes at Stanhope

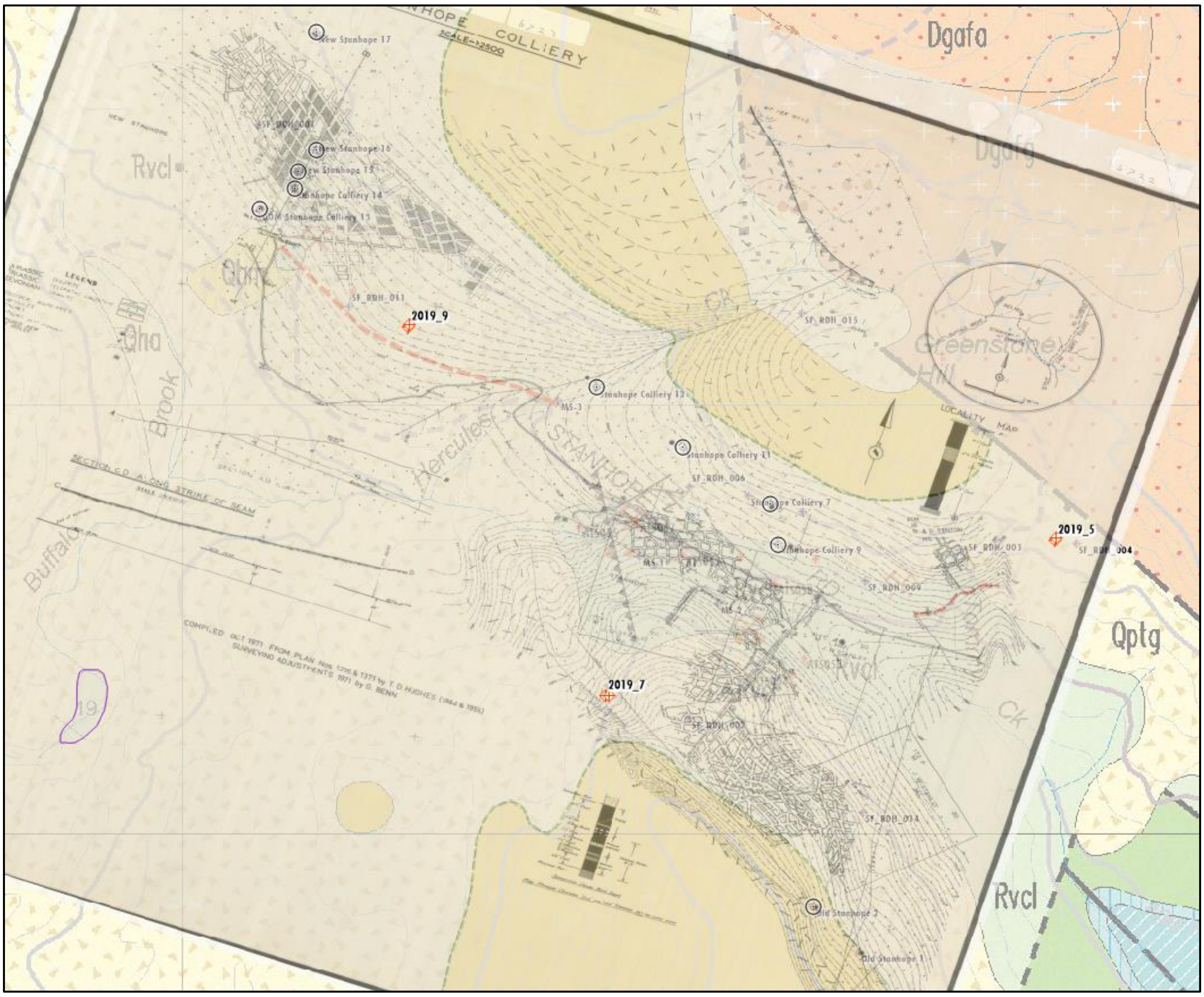
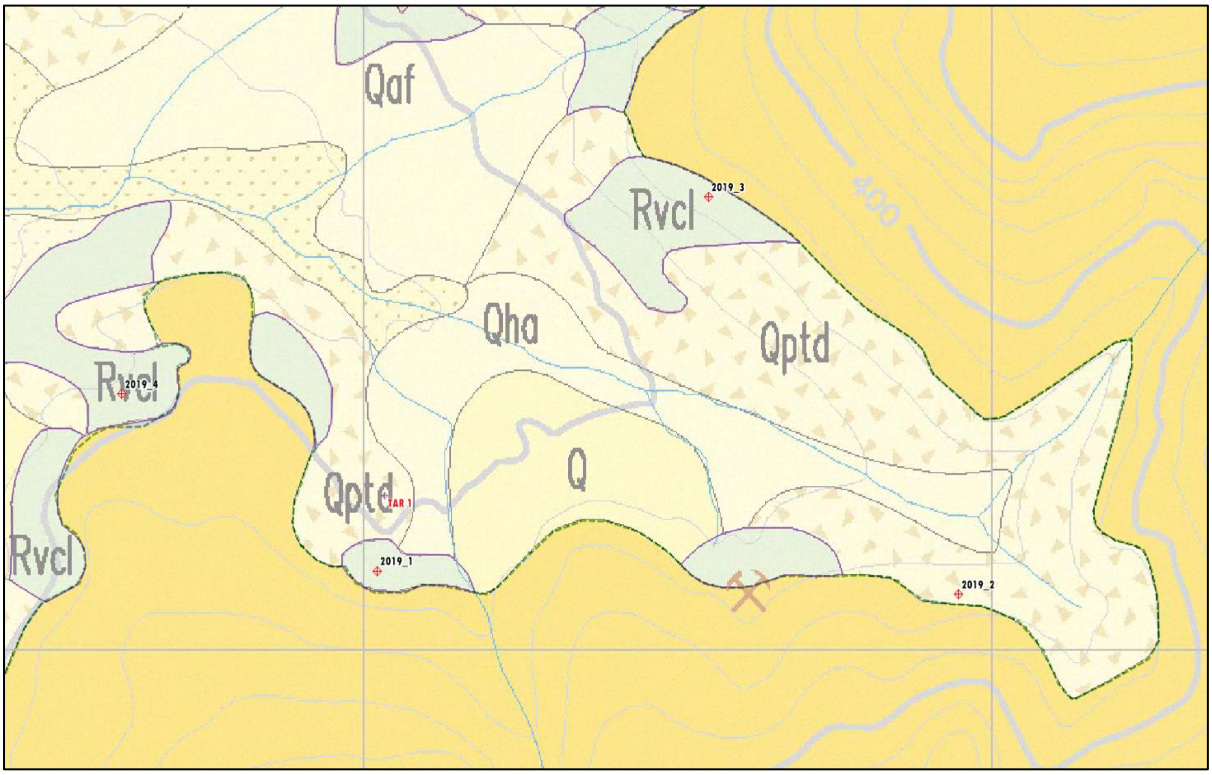


Figure 7: Location of Exploration Boreholes at Bonney's Plain's



The locations and the proposed depths of the drill holes are shown in Table 7.

Table 7: Proposed Drill Holes Avoca West

SITE_ID	Location	EAST MGA94 Z55	NORTH MGA94 Z55	AHD	Total Depth	Type	Purpose
2019_01	Bonneys Plains	554025	5376735	220	120	chip	Exploration
2019_02	Bonneys Plains	554950	5376850	220	120	chip	Exploration
2019_03	Bonneys Plains	555350	5377304	220	120	chip	Exploration
2019_04	Bonneys Plains	554230	5378170	220	120	chip	Exploration
2019_05	Mt Christie	556022	5380681	300	120	Pilot	Infill and Coal Quality
2019_06	Mt Christie	556025	5380685	220	65	4C Core	Coal Quality and Geotech
2019_07	Stanhope South	554982	5380321	250	120	Pilot	Infill and Coal Quality
2019_08	Stanhope South	554990	5380320	220	65	4C Core	Coal Quality and Geotech
2019_09	Fenhope NW	554527	5381175	230	120	Pilot	Infill and Coal Quality
2019_10	Fenhope NW	554530	5381178	220	65	4C Core	Coal Quality and Geotech

The following tasks need to be implemented to allow drilling to commence:

- Prepare a “Proposed Exploration Work Program”, submit to the MRT for approval and notify affected landholders.
- Engage drilling, logging, surveying, earth moving contractors and coal quality testing laboratory.
- Prepare Safety Management Plan.
- Mark out drill sites and obtain MRT clearance for access.
- Supervise drill program and data collection.
- Rehabilitate drill sites.
- Evaluate data and prepare report.
- Prepare MRT statutory annual report.

The drilling program and related site activities is estimated to take 25 days to complete as drilling through dolerite is generally slow. A wet weather contingency has also been included. Preliminary planning and data evaluation and final reporting is estimated to take 15 days to complete.

The drilling program would be conducted by an experienced coal exploration geologist who would be supported by a senior geologist as required. An infield Exploration Manager would supervise the project. The drilling program will require formal approval by Mineral Resources Tasmania prior to commencement and all affected landholders will have to be personally advised at least 14 days prior to commencement of work. All exploration work will be conducted under the Tasmanian Mineral Exploration Code of Practice.

DISCUSSION OF RESULTS

Modelling work is ongoing and funding to complete the work program continues to be sought.

CONCLUSIONS

Prospects for success within EL1-2015 are as follows:

- Junction Coal has identified 15-25Mt of coal resources currently undergoing final estimation and reporting to the JORC Code 2012.
- The area is in the known Tasmanian coalfields/coal mining area.
- Tasmanian government is looking for projects to create local jobs.
- MRT has indicated granting of a mining lease possible.
- Australian Bauxite Limited (ASX: ABX) are mining bauxite nearby at Campbelltown so some infrastructure and equipment available.
- Proving a semi-soft coking coal resource in the unmined D seam would increase the valuation of the project at least twofold.

FUTURE EXPLORATION

The proposed work program for Year 5 is as follows:

- Complete resource estimation and reporting to the JORC 2012 Code,
- A ten (10) hole drilling program consisting of three (3) partially-core holes and seven (7) rotary chip holes,
- Downhole geophysically logging,
- CQ sampling and analysis.

ENVIRONMENTAL MANAGEMENT

No surface disturbance activities took place in the current reporting period (Year 4).

EXPENDITURE

Junction Coal has met the $55,000 expenditure commitment for Year 4. The Expenditure Statement below (Table 8) shows the actual monies expended on exploration activities for the year.

Table 8: Year 4 Expenditure Statement for EL1/2015

No.	Costs	Type	Annual Expenditure
1	Geoscientific	Geology	$51,469.44
		Geochemistry	-
		Geophysics	-
		Remote Sensing	-
2	Drilling and Gridding	Gridding	-
		Drilling	-
3	Land Access		-
4	Rehabilitation		-
5	Feasibility Study		-
6	Other	Rental Fees	-
		Vehicular Track Construction	-
		Surveying	-
		Capital Equipment	-
7	Administration Costs		$5,146.94
	TOTAL EXPENDITURE		**$56,616.38**

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