**BATHURST**
RESOURCES LIMITED

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Market Announcements
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Sydney
NSW 2000

## Bathurst Resources Limited - Update on Resources and Reserves

The Board of Bathurst Resources Limited (ASX: BRL "Bathurst") is pleased to announce an update on Resources and Reserves.

During the past year work has been ongoing to update the company's Resources and Reserves to comply with the Joint Ore Reserves Committee (JORC) 2012 code.

The key indicator of total Resources shows a small reduction from 108.2 million tonnes to 108 million tonnes. While there was a maiden Resource announced for New Brighton of 0.2 million tonnes, and the Canterbury Measured Resource increased by 0.2 million tonnes this was offset by depletion due to mining at the company's domestic operations on the West Coast and at Takitimu, in Southland.

The Resource tonnages at New Brighton showed a decrease in Indicated and Inferred Resources due to a revised model of total open cast recovery with no underground extraction.

Marketable Reserves increased overall due to revised economic modelling based on an improved coal price and reduced operating costs at Escarpment and Takitimu.

The documents appended have been generated as JORC Table 1 disclosures as required under clause 5 of the JORC (2012) code. The Table 1 documents support both first release and materially changed Mineral Resources or Ore Reserves for significant Bathurst projects.

Where there has been no material change the company has continued to report under the JORC 2004 standard.

On behalf of Bathurst Resources Limited

Toko Kapea
Chairman

# Coal Resources and Reserves

## RESOURCES

### Table 1 – Resource Tonnes [1]

| Area | 2016 Measured Resource (Mt) | 2015 Measured Resource (Mt) | Change (Mt) | 2016 Indicated Resource (Mt) | 2015 Indicated Resource (Mt) | Change (Mt) | 2016 Inferred Resource (Mt) | 2015 Inferred Resource (Mt) | Change (Mt) | 2016 Total Resource (Mt) | 2015 Total Resource (Mt) | Change (Mt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Escarpment [2] | 3.1 | 3.1 | 0.0 | 2.1 | 2.2 | -0.1 | 1.0 | 1.0 | 0.0 | 6.2 | 6.3 | -0.1 |
| Cascade [3] | 0.5 | 0.6 | -0.1 | 0.6 | 0.6 | 0.0 | 0.3 | 0.3 | 0.0 | 1.5 | 1.5 | 0.0 |
| Deep Creek [4] | 6.2 | 6.2 | 0.0 | 3.1 | 3.1 | 0.0 | 1.6 | 1.6 | 0.0 | 10.9 | 10.9 | 0.0 |
| Coalbrookdale | 0.0 | 0.0 | 0.0 | 3.8 | 3.8 | 0.0 | 5.4 | 5.4 | 0.0 | 9.2 | 9.2 | 0.0 |
| Whareatea West | 7.6 | 7.6 | 0.0 | 10.8 | 10.8 | 0.0 | 4.9 | 4.9 | 0.0 | 23.3 | 23.3 | 0.0 |
| **South Buller Totals** | **17.4** | **17.5** | **-0.1** | **20.4** | **20..5** | **-0.1** | **13.2** | **13.2** | **0.0** | **51.1** | **51.2** | **-0.1** |
| Millerton North [4] | 0.0 | 0.0 | 0.0 | 1.9 | 1.9 | 0.0 | 3.6 | 3.6 | 0.0 | 5.5 | 5.5 | 0.0 |
| North Buller | 2.4 | 2.4 | 0.0 | 7.3 | 7.3 | 0.0 | 10.9 | 10.9 | 0.0 | 20.6 | 20.6 | 0.0 |
| Blackburn[4] | 0.0 | 0.0 | 0.0 | 5.8 | 5.8 | 0.0 | 14.1 | 14.1 | 0.0 | 19.9 | 19.9 | 0.0 |
| **North Buller Totals** | **2.4** | **2.4** | **0.0** | **15.0** | **15.0** | **0.0** | **28.6** | **28.6** | **0.0** | **46.0** | **46.0** | **0.0** |
| **Buller Coal Project Totals** | **19.8** | **19.9** | **-0.1** | **35.4** | **35.5** | **-0.1** | **41.8** | **41.8** | **0.0** | **97.1** | **97.2** | **-0.1** |
| Takitimu [5] | 1.0 | 1.6 | -0.6 | 1.9 | 1.7 | 0.2 | 0.8 | 1.3 | -0.5 | 3.7 | 4.6 | -0.9 |
| New Brighton [6] | 0.2 | 0.0 | 0.2 | 0.4 | 0.7 | -0.3 | 1.3 | 3.5 | -2.2 | 1.9 | 4.2 | -2.3 |
| Canterbury Coal [7] | 0.5 | 0.3 | 0.2 | 1.4 | 0.5 | 0.9 | 3.4 | 1.3 | 2.1 | 5.3 | 2.1 | 3.2 |
| **Southland/ Canterbury Totals** | **1.7** | **1.9** | **-0.2** | **3.7** | **2.9** | **0.8** | **5.5** | **6.1** | **-0.6** | **10.9** | **10.9** | **0.0** |
| **Total** | **21.5** | **21.8** | **-0.3** | **39.1** | **38.4** | **0.7** | **47.3** | **47.9** | **-0.6** | **108.0** | **108.2** | **-0.2** |

*Note*

*All resources and reserves quoted in this release are reported in terms as defined in the 2004 and 2012 Editions of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' as published by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia ("JORC").*

1.     *The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce the Ore Reserves.*

    *Resource tonnages have been calculated using a density value calculated using approximated in-ground moisture values (Preston and Sanders method) and as such all tonnages quoted in this report are wet tonnes. All coal qualities quoted are on an Air Dried Basis.*

    *Rounding of tonnes as required by reporting guidelines may result in summation differences between tonnes and coal quality*

2.     *Escarpment resources were depleted by mining. Further resources were identified due to additional drilling and an updated geological model.*

3.     *Cascade resources were depleted by mining.*

4.     *No additional work has been was undertaken on the coal resources for Deep Creek, Millerton North and Blackburn since originally reported.*

    *This information was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported.*

5.     *Resources were depleted by mining. Additional drilling and a revision of the geological model resulted in an overall decrease in the resource tonnage. Takitimu resources include Black Diamond and Coaldale.*

6.     *Additional drilling and a revision of the geological model resulted in improved resource confidence. Potential underground resources reported previously have been removed from resource estimates*

7.     *Additional drilling, improved mining economics and a revision of the geological model have resulted in improved resource confidence and an overall increase in the resource tonnage.*

## Table 2 – Average Coal Quality - Measured

| Area | Measured Resource (MT) | ASH% (AD) | SULPHUR % AD | VOLATILE MATTER % (AD) | FIXED CARBON % (AD) | CSN | INHERENT MOISTURE | IN SITU MOISTURE | CALORIFIC VALUE (AD) |
|---|---|---|---|---|---|---|---|---|---|
| Escarpment | 3.1 | 20.0 | 0.57 | 32.7 | 46.3 | 7.0 | 0.9 | 5.5 | 28.5 |
| Cascade | 0.5 | 15.5 | 1.66 | 39.3 | 42.6 | 4.5 | 2.6 | 7.6 | 30.8 |
| Deep Creek | 6.2 | 11.0 | 2.50 | 32.9 | 53.9 | - | 2.2 | 5.2 | 29.7 |
| Whareatea West | 7.6 | 23.0 | 0.82 | 24.2 | 52.2 | 7.0 | 0.6 | 6.3 | 26.8 |
| Millerton North | -0.0 | - | - | - | - | - | - | - | - |
| North Buller | 2.4 | 8.6 | 4.70 | 43.1 | 45.4 | 4.5 | 2.9 | 11.4 | 29.7 |
| Blackburn | -0.0 | - | - | - | - | - | - | - | - |
| Takitimu | 1.0 | 11.7 | 0.42 | 37.4 | 35.4 | N/A | 15.5 | 24.7 | 21.4 |
| New Brighton | 0.2 | 10.7 | 0.37 | 35.9 | 39.1 | N/A | 14.3 | 21.0 | 22.7 |
| Canterbury Coal | 0.5 | 8.4 | 0.74 | 36.1 | 39.6 | N/A | 15.9 | 25.5 | 22.2 |

## Table 3 – Average Coal Quality - Indicated

| Area | Indicated Resource (MT) | ASH% (AD) | SULPHUR % AD | VOLATILE MATTER % (AD) | FIXED CARBON % (AD) | CSN | INHERENT MOISTURE | IN SITU MOISTURE | CALORIFIC VALUE (AD) |
|---|---|---|---|---|---|---|---|---|---|
| Escarpment | 2.1 | 19.2 | 1.11 | 35.0 | 44.6 | 7.0 | 1.2 | 5.3 | 30.3 |
| Cascade | 0.6 | 14.8 | 1.79 | 38.3 | 44.5 | 4.0 | 2.4 | 8.0 | 29.3 |
| Deep Creek | 3.1 | 9.7 | 2.70 | 34.7 | 53.6 | - | 2.0 | 4.8 | 30.3 |
| Coalbrookdale | 3.8 | 18.4 | 1.43 | 36.3 | 43.5 | 5.0 | 1.8 | 6.1 | 30.0 |
| Whareatea West | 10.8 | 22.1 | 0.93 | 22.7 | 54.5 | 6.5 | 0.6 | 6.3 | 25.6 |
| Millerton North | 1.9 | 9.7 | 4.90 | 36.9 | 52.4 | 10.0 | 1.0 | 6.1 | 31.1 |
| North Buller | 7.3 | 8.8 | 5.10 | 42.6 | 46.3 | 5.0 | 2.3 | 9.4 | 30.0 |
| Blackburn | 5.8 | 3.9 | 4.30 | 42.1 | 51.8 | 6.0 | 2.2 | 10.1 | 30.4 |
| Takitimu | 1.9 | 9.7 | 0.31 | 36.3 | 38.0 | N/A | 16.0 | 25.5 | 21.5 |
| New Brighton | 0.4 | 9.0 | 0.34 | 35.9 | 42.1 | N/A | 12.9 | 20.5 | 23.7 |
| Canterbury Coal | 1.4 | 8.2 | 0.74 | 36.1 | 39.5 | N/A | 16.1 | 25.7 | 22.2 |

## Table 4 – Average Coal Quality - Inferred

| Area | Inferred Resource (MT) | ASH% (AD) | SULPHUR % AD | VOLATILE MATTER % (AD) | FIXED CARBON % (AD) | CSN | INHERENT MOISTURE | IN SITU MOISTURE | CALORIFIC VALUE (AD) |
|---|---|---|---|---|---|---|---|---|---|
| Escarpment | 1.0 | 18.4 | 1.70 | 35.5 | 44.7 | 7.0 | 1.4 | 5.7 | 30.2 |
| Cascade | 0.3 | 16.5 | 2.16 | 36.7 | 44.7 | 4.0 | 2.1 | 6.7 | 27.6 |
| Deep Creek | 1.6 | 10.1 | 2.40 | 29.7 | 57.8 | - | 2.4 | 7.1 | 29.7 |
| Coalbrookdale | 5.4 | 16.4 | 1.50 | 35.2 | 46.7 | 5.0 | 1.7 | 5.5 | 29.1 |
| Whareatea West | 4.9 | 21.7 | 0.92 | 21.3 | 56.3 | 6.0 | 0.7 | 6.3 | 24.6 |
| Millerton North | 3.6 | 12.0 | 5.50 | 35.3 | 51.6 | 9.0 | 1.1 | 7.2 | 30.2 |
| North Buller | 10.9 | 9.9 | 5.10 | 45.6 | 42.3 | 5.0 | 2.2 | 9.6 | 29.5 |
| Blackburn | 14.1 | 6.4 | 4.80 | 41.8 | 49.5 | 6.0 | 2.3 | 11.2 | 30.1 |
| Takitimu | 0.8 | 12.4 | 0.39 | 36.2 | 36.0 | N/A | 15.4 | 25.0 | 20.9 |
| New Brighton | 1.3 | 9.0 | 0.30 | 35.7 | 43.6 | N/A | 11.6 | 19.6 | 24.1 |
| Canterbury Coal | 3.4 | 9.1 | 0.79 | 36.0 | 39.0 | N/A | 15.8 | 25.5 | 22.0 |

**RESERVES** [8]

**Table 5 – Coal Reserves (ROM [9]) Tonnes**

| ROM Coal | Proved (Mt) | | | Probable (Mt) | | | Total (Mt) | | |
|---|---|---|---|---|---|---|---|---|---|
| Area | 2016 | 2015 | Change | 2016 | 2015 | Change | 2016 | 2015 | Change |
| Escarpment Domestic [10] | 0.2 | 0.0 | 0.2 | 0.1 | 0.2 | -0.1 | 0.3 | 0.2 | 0.1 |
| Escarpment Export | 2.3 | 2.3 | 0.0 | 0.5 | 0.5 | 0.0 | 2.8 | 2.8 | 0.0 |
| Whareatea West | 0.0 | 0.0 | 0.0 | 15.8 | 15.8 | 0.0 | 15.8 | 15.8 | 0.0 |
| Takitimu [11] | 0.5 | 0.5 | 0.0 | 1.1 | 0.7 | 0.4 | 1.6 | 1.2 | 0.4 |
| Canterbury Coal[12] | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.1 | 0.2 | 0.0 | 0.2 |
| **Total** | **3.1** | **2.8** | **0.3** | **17.6** | **17.2** | **0.4** | **20.7** | **20** | **0.7** |

**Table 6 - Marketable Coal Reserves [13] Tonnes**

| | Proved (Mt) | | | Probable (Mt) | | | Total (Mt) | | |
|---|---|---|---|---|---|---|---|---|---|
| Area | 2016 | 2015 | Change | 2016 | 2015 | Change | 2016 | 2015 | Change |
| Escarpment Domestic [10] | 0.2 | 0.0 | 0.2 | 0.1 | 0.2 | -0.1 | 0.3 | 0.2 | 0.1 |
| Escarpment Export | 1.9 | 1.9 | 0.0 | 0.4 | 0.4 | 0.0 | 2.3 | 2.3 | 0.0 |
| Whareatea West | 0.0 | 0.0 | 0.0 | 9.9 | 9.9 | 0.0 | 9.9 | 9.9 | 0.0 |
| Takitimu [11] | 0.5 | 0.5 | 0.0 | 1.0 | 0.7 | 0.3 | 1.5 | 1.2 | 0.3 |
| Canterbury[12] | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.1 | 0.2 | 0.0 | 0.2 |
| **Total** | **2.7** | **2.4** | **0.3** | **11.5** | **11.2** | **0.3** | **14.2** | **13.6** | **0.6** |

**Table 7 – Marketable Coal Reserves - Proved and Probable Average Quality**

| Deposit [10,11,12,13] | Proved Marketable [13] | | | | | | Probable Marketable [13] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Mt) | Ash (%) | Sulphur (%) | VM (%) | CSN (#) | CV (MJ/Kg) | (Mt) | Ash (%) | Sulphur (%) | VM (%) | CSN (#) | CV (MJ/Kg) |
| Escarpment Export | 1.9 | 8.9 | 0.5 | 35.1 | 8.5 | 31.3 | 0.4 | 7.1 | 0.6 | 36.4 | 8.5 | 32.0 |
| Whareatea West | 0.0 | - | - | - | - | - | 9.9 | 12.1 | 0.9 | 26.0 | 9.5 | 31.9 |
| Escarpment Domestic [10] | 0.2 | 12.9 | 1.9 | 35.0 | 6.8 | 28.9 | 0.1 | 14.5 | 1.5 | 34.0 | 6.1 | 28.4 |
| Takitimu [11] | 0.5 | 9.2 | 0.3 | 36.9 | N/A | 21.9 | 1.0 | 6.3 | 0.24 | 36.0 | N/A | 22.1 |
| Canterbury[12] | 0.1 | 8.4 | 0.8 | 36.8 | N/A | 22.3 | 0.1 | 8.6 | 0.8 | 36.8 | N/A | 22.2 |

**Table 8 - Marketable Coal Reserve – Total Average Quality**

| Deposit (7, 8, 10,11,12) | Coal Type | Mining Method | Total Marketable [13] | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | (Mt) | Ash (%) | Sulphur (%) | VM (%) | CSN (#) | CV (MJ/Kg) |
| Escarpment Export | Met | Open Pit | 2.3 | 8.6 | 0.5 | 35.3 | 8.5 | 31.4 |
| Whareatea West | Met | Open Pit | 9.9 | 12.1 | 0.9 | 26.0 | 9.5 | 31.9 |
| Escarpment Domestic [10] | Thermal | Open Pit | 0.2 | 13.3 | 1.8 | 34.7 | 6.6 | 28.8 |
| Takitimu[11] | Thermal | Open Pit | 1.5 | 7.2 | 0.3 | 36.3 | N/A | 22.0 |
| Canterbury[12] | Thermal | Open Pit | 0.1 | 8.5 | 0.8 | 36.8 | N/A | 22.3 |

*Note*

*All reserves quoted in this release are reported in terms as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' as published by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia ("JORC").*

|  | |
|---|---|
|  | *The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce the Ore Reserves.* |
| 8 | *Reserve tonnages have been calculated using a density value calculated using approximated in-ground moisture values (Preston and Sanders method) and as such reserve tonnages quoted in this report are wet tonnes.  All coal qualities quoted are on an Air Dried Basis.* |
|  | *Rounding of tonnes as required by reporting guidelines may result in summation differences between tonnes and coal quality* |
| 9 | *Coal reserve estimates (Run of Mine (ROM) tonnes), include consideration of standard mining factors ( JORC Code 2012)* |
| 10 | *Change in Domestic reserves based on a revised economics and additional exploration.* |
| 11 | *Increase in coal reserves due to increased resources, revised mining plans and economics. Takitimu reserves include Black Diamond and Coaldale.* |
| 12 | *New reserve defined 2016* |
|  | *Marketable Reserves are based on geologic modelling of the anticipated yield from ROM Reserves.* |
|  | *Total Marketable Coal Reserves are reported at a product specific moisture content (10–12% for Escarpment Export and Whareatea West, 5-8% at Escarpment Domestic and 22-23% at Takitimu and Canterbury ) and at an air-dried quality basis, for sale after the beneficiation of the Total Coal Reserves, converted using ASTM D3180 ISO 1170* |
| 13 | *Reserve tonnages have been calculated using a density value calculated using approximated in-ground moisture values (Preston and Sanders method) and as such all tonnages quoted in this report are wet tonnes.  All coal qualities quoted are on an Air Dried Basis.* |

## Resource Quality

The company is not aware of any information to indicate that the quality of the identified resources will fall outside the range of specifications for reserves as indicated in the above table.

Further resource and reserve information can be found on the company's website at www.bathurstresources.co.nz

# Mineral Resource and Ore Reserves Governance and Estimation Process

Resources and Reserves are estimated by internal and external personnel, suitably qualified as Competent Persons under the Australasian Institute of Mining and Metallurgy, reporting in accordance with the requirements of the JORC code, industry standards and internal guidelines.

All Resource estimates and supporting documentation are reviewed by a Competent Person either employed directly by Bathurst or employed as an external consultant. If there is a material change in an estimate of a Resource, or if the estimate is an inaugural Resource, the estimate and all relevant supporting documentation is further reviewed by an external suitably qualified Competent Person.

All Reserve estimates are prepared in conjunction with pre-feasibility, feasibility and life of mine studies which consider all material factors.

All Resource and Reserve estimates are then further reviewed by suitably qualified internal management.

## Competent Person Statements

*The information on this report that relates to mineral resources for Deep Creek and the mineral reserves for Escarpment Export and Whareatea West is based on information compiled by Sue Bonham-Carter who is a full time employee of Golder Associates (NZ) Ltd and is a member of the Australasian Institute of Mining and Metallurgy.  Sue Bonham-Carter has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she is undertaking to qualify as a Competent Person as defined in the 2004 and  2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.  Sue Bonham-Carter consents to the inclusion in this report of the matters based on her information in the form and context in which it appears above.*

*The information in this report that relates to exploration results and mineral resources for Escarpment, Cascade, Coalbrookdale, Whareatea West, Millerton North, North Buller, Blackburn, Takitimu, Canterbury Coal and New Brighton and the mineral reserves for Takitimu is based on information compiled by Hamish McLauchlan as a Competent Person who is a full time employee of Bathurst Resources Limited and is a member of the Australasian Institute of Mining and Metallurgy. Mr. McLauchlan has a B.Sc and M.Sc (Hons) majoring in geology from the University of Canterbury, and has had 19 years of experience in the mineral resource industry in New Zealand and offshore.  He has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 and 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr McLauchlan consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears above. This presentation accurately reflects the information compiled by the Competent Person.*

*The information on this report that relates to mineral reserves for Escarpment Domestic and Canterbury is based on information compiled by Terry Moynihan who is a full time employee of Core Mining Consultants Ltd and is a member of the Australasian Institute of Mining and Metallurgy.  Mr. Moynihan has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.*

# JORC Code, 2012 Edition – Table 1

## Section 4 Estimation and Reporting of Ore Reserves – Escarpment Extension Project (Escarpment Export, Whareatea West and Coalbrookdale)

| Criteria | Commentary |
|---|---|
| *Mineral Resource estimate for conversion to Ore Reserves* | • Reserve Estimate was completed by Golder Associates (NZ) Limited.<br>• Escarpment Mine reserves are reported separately for Domestic and Export coal 2015. The domestic portion of reserves are reported by others and not covered in this Table 1, Section 4.<br>• A 3D block geology model generated by Bathurst Resources Limited (BRL) was used for in situ resource definition and supplied to Golder for the Preliminary Feasibility Study (PFS). Golder has relied on this information for the study and has not performed detailed model validation or model input checks. Golder considers the model to be reasonable and constructed using a robust modelling process.<br>• The model was depleted to account for areas where previous underground extraction has taken place, based on historic recovery factors described by BRL in Section 3 of Table 1 for Reporting of Ore Resources (JORC).<br>• Coal Resources are reported inclusive of, the Ore Reserves.<br>• A 3D block mining model was generated which included minimum seam thickness, mining losses and dilution using Vulcan™ software.<br>• Pit design extents were established using standard Lerchs-Grossman pit design techniques and based on preliminary economic and geotechnical inputs.<br>• Mine design strips by bench were applied to develop a mine schedules and used as a basis for reporting reserves.<br>• Reserve estimates include consideration of material modifying factors including: the status of environmental approvals; other governmental factors and infrastructure requirements for selected open pit mining methods and coal transportation to market (per JORC Code 2012).<br>• Reserve tonnages have been estimated using a density value calculated using approximated in-ground moisture values (Preston and Sanders method). As such, all tonnages quoted in this report are wet tonnes.<br>• All coal qualities quoted are on an Air Dried Basis (adb).<br>• A decrease in the previously reported export reserves is based on change in mine plan and economics.<br>• Approximately 90% of total reserve coal tonnes require washing to make a marketable product.<br>• Marketable coal tonnes are reported using an estimated total moisture content of 10% converted from in situ using ASTM D3180 ISO 1170. |
| *Site visits* | • The Reserves Competent Person (CP) is Sue Bonham-Carter of Golder Associates (NZ) Ltd.. Ms. Bonham-Carter has visited the site several times since an initial visit for the Escarpment Extension Project (EXP) undertaken on 11 November 2013. Hamish McLauchlan, BRL Manager of Exploration and the EXP project manager, conducted the visit around the proposed mine area. The group viewed the upgraded access road to the existing Escarpment mine, existing access tracks and power lines in the EXP future expansion areas, areas for environmental consideration, and potential areas for ex-pit waste disposal sites. |
| *Study status* | • The reportable Ore Reserve is based on a Pre- Feasibility Study (PFS) conducted in 2015 by Golder on behalf of BRL. The PFS assessed an updated Life of Mine Plan for the Escarpment mine and planned extension into the adjacent Whareatea and Coalbrookdale Blocks.<br>• The 2015 PFS included re-assessment of material modifying factors including production rate, economic assumptions, specifically coal sale price and development capital options analysis. |
| *Cut-off parameters* | • Minimum seam thickness is set at 0.5m or one block in height in 3D resource block model. |

| Criteria | Commentary |
|---|---|
| *Mining factors or assumptions* | <ul><li>A key project assumption is the use of fit-for-purpose coal processing and transport infrastructure that already exists in the Buller coalfield, reducing the requirement for BRL to invest in new infrastructure. This infrastructure has sufficient excess capacity which could be utilised by BRL for processing and transport of Escarpment and Whareatea coals at the rates planned in the PFS study.</li><li>The mining method proposed is standard small scale diesel powered truck-excavator operation. This methodology is consistent with those currently used at the Escarpment mine and neighboring BRL Cascade operations as well as other operating mines in the vicinity.</li><li>Modifying factors were applied in the mining block model taking into account:<ul><li>Loss and dilution assumptions at each seam interface (roof and floor);</li><li>Minimum mineable thickness;</li><li>Minimum separable parting thickness;</li><li>Previous underground (UG) extraction estimates and surface mining recovery assumptions;</li><li>Contaminated coal production assumptions (wash plant feed proportions); and</li><li>Coal wash plant performance (recovery);</li></ul></li><li>Coal quality estimation and dilution and loss adjustments were incorporated in the block model. Run of Mine (ROM) coal was separated into face (clean) and wash coal products. Clean ROM coal will be trucked to a proposed BRL operated rail siding located approximately 1.5 km south-west of the township of Waimangaroa. Mining horizons were modelled in two passes; one for Clean (bypasses the wash plant) and one for Wash.</li><li>Underground factors were applied in the mining model using triangulations based on digitised historic plans of the underground and surface workings. BRL supplied this historic data to Golder. UG factors applied were as follows:</li></ul> |

| Workings Type | UG Extracted Rate (%) | Mining Loss (%) | Mining Contam nated (%) | Mining Dilution (%) |
|---|---|---|---|---|
| Unworked | | | | |
| First Worked | 35 | 10 | 15 | 7 |
| Second Worked | 53 | 10 | 24 | 8 |
| Hydro Worked | 73 | 5 | 22 | 11 |

- Surface mining modifying factors and their values:

| Mining Factor | Model Value (in m) | Description |
|---|---|---|
| Roof Loss | 0.15 | Coal lost at the seam roof during cleaning |
| Floor Loss | 0.15 | Coal left in the floor at the end mining |
| Roof Contamination | 0.25 | Coal contaminated (coal mixed with waste) at roof |
| Floor Contamination | 0.25 | Coal contaminated (coal mixed with waste) at floor |
| Roof Dilution | 0.05 | Roof stone left behind by cleaning and included in mined coal |
| Floor Dilution | 0.10 | Floor stone mined with the coal |

- Plant Feed Tonnages were calculated by removing a percentage of the tonnes on the basis that a proportion of dilution/coal is rejected by grizzly and breaker. 20% of the dilution was assumed to be removed and 2 % of the coal was assumed to be lost.
- Plant Feed qualities were calculated as above– by reducing the units of the recovered resource qualities and diluent qualities by 2% and 20% respectively.
- Product Tonnages were calculated using 2 linear Coal Washability yield relationships based on feed ash quality, as follows:
  - Face Wash Feed Coal Product Yield = 95.8990 - (1.1497 * Plant Feed Ash); and
  - Contaminated Wash Feed Coal Product Yield = 93.5218 - (1.1196 * Plant Feed

| Criteria | Commentary |
|---|---|

Ash).

- Product ash was calculated using a relationship for ash beneficiation by feed type:
  - Face Coal Product Ash =max(9.5140 * (2.7182818~(0.0121 *Plant Feed Ash)),5.60).
  - Contaminated Coal Product Ash = max(3.2410 * (2.7182818~(0.0245 * Plant Feed Ash)),3.43).
- Product swell (CSN) was calculated using separate CSN vs. product ash relationships for each area (Coalbrookdale, Escarpment, Whareatea), provided by BRL by area and further limited to a maximum CSN by defined boundaries interpreted by BRL.
- RoMax was calculated using a linear relationship between RoMax and the Volatile Matter (% dmmsf) that has been developed by BRL as follows:
  - Product RoMax = -0.042 * Product Volatiles (dmmsf) + 2.4885
  - Product CV estimated by area based on relationships for:
    - ESC, 35<vm<40: cv_ad = -0.3817*as_ad + 34.717
    - WW, vm<30: cv_ad = -0.4235 * as_ad + 37.04
- All other qualities were based on weight averaging with stated assumptions for combination and/or separation of materials (e.g. breaker loss 2% coal & 20% of diluent material).
- Plant yield and product ash calculations are consistent with feasibility level assumptions for the currently operating Stockton processing plant which operates with similar, but not the same, types of coal from within the same coal field.
  - Whareatea in particular has a significant amount of high ash coal requiring processing (92% of total) and is high rank. Since much of this coal has high inherent ash (as opposed to high ash due to dilution) and the washability of this coal has not been adequately characterized. This is a considered a significant project risk. Further coal washability testing will be required to properly assess the value of the coal within the areas of interest.
- Lerch Grossman (LG) pit optimization techniques were used to generate pit shells based on preliminary economic and geotechnical inputs in March 2015. The optimisation considered all resources in the model within the BRL controlled permit boundaries, and was constrained by pertinent environmental considerations. Based on a blend optimisation study, the PFS assumed that BRL can blend all product coal (except minor amounts of high sulphur coal) to a specification that will achieve a benchmark Hard Coking or Semi Hard Coking price. The mine design for the base plan and schedule is derived from the optimization results.
- Initial pit stages focused on lower strip ratio areas initially in order to generate higher cashflows early in mine life.
- The PFS base case targeted 750 thousand tonnes per annum (ktpa) of marketable coal product. At this rate the mine life is estimated to be approximately 20 years. A base schedule has been adopted that achieves this while developing both pits concurrently to target consistent coal quality from year to year. The schedule requires waste movement rates of up to approximately 8 Mbcm for approximately the first 10 years with a ramp up to full production over 3-4 years.
- Inferred Mineral Resources are included in the pit design shells and mine schedule, being 21% of total. Initial mining stages are designed to target measured or indicated resources. The economic model was tested with and without Inferred resources and was found to remain economic without the Inferred resources. (refer to the sub section entitled "Economic" below).

Indicated and Inferred Resources within Life of Mine Plan are presented in the table below:

| Total Scheduled | Indicated | | Inferred | |
|---|---|---|---|---|
| (Mt) | % | (Mt) | % | (Mt) |
| 23.4 | 38 | 8.8 | 21 | 4.8 |

- Waste disposal design assumed a material swell factor of 1.25, accounting for a degree of compaction is achieved for AMD (Acid Mine Drainage) control.

| Criteria | Commentary |
|---|---|
| | • Geotechnical assumptions for slope design were based on parameters derived for Escarpment mine design in the DFS by Golder in 2010, supported by results of a preliminary seismic assessment undertaken by Golder in 2013.<br><br>PFS Basis of Design criteria are presented in the following tables.<br><br>Engineered Land Fill (ELF)<br><br>

| Material Swell Factor | 1.25 (assumes some degree of compaction for AMD control) |
|---|---|
| Ex-pit ELF | Overall batter slope: | 18° |
| In-pit backfill | Overall batter slope: | *18° to 28° |

* Slope angle varies depending on location and status (i.e. temporary or final)

Pit Wall Profiles

| Horizon | Wall Profile | |
|---|---|---|
| Overburden | Bench Height:<br>Batter Slope:<br>Berm Width:<br>Overall wall angle: | 15 m<br>65°<br>11.5 m<br>39° |
| M2 Seam | Bench Height:<br>Batter slope: | 15 m maximum<br>51° |

• Rehabilitation requirements and methodology were presumed to be similar to those in the existing Escarpment Mine permit. |
| **Metallurgical factors or assumptions** | • Approximately 90% of coal produced will require washing to make a marketable product.<br>• The PFS assumed that a fully commissioned coal handling and processing plant (CHPP) would be available. All coal requiring washing was assumed to be processed at the existing Coal Handling and Processing Plant (CHPP) located approximately 20 km to the northeast and accessed via a BRL proposed new coal road (Figure 1 attached). The washed coal transport system comprises a combination of road and aerial ropeway from Stockton mine to the Ngakawau loadout facility for rail transport to the port.<br>• Processes used at the proposed CHPP are standard coal industry practice using proven technologies.<br>• Clean coal not requiring washing would be transported by road directly from the Denniston plateau to a new BRL siding to be situated at Waimangaroa on the coastal flats. This approach allows for the use of existing infrastructure capacity within the region and reduces start-up capital requirements significantly for the project.<br>• Processing plant relationships for yield and product qualities were supplied to Golder by BRL and are based on limited samples only. The metallurgical data was developed from the Stockton CHPP washability curves and are consistent as those applied in the 2010 DFS. These have been assumed to be representative of the expected performance of a coal processing plant in the South Buller coal field for the PFS. This remains a significant area of uncertainty, both with projected yields and resulting processed coal product qualities.<br>• No pilot scale test work has been completed for processing of Escarpment or Whareatea resources.<br>• Deleterious elements modelled included sulfur and ash. Concentrations are considered to be within the marketable range. Phosphorous was not modelled, but analyses indicate that this is low relative to other traded coals, consistent with coals produced from the nearby Stockton mine.<br>• Rejects and tails were assumed to be disposed of within the adjacent Stockton facilities. |

| Criteria | Commentary |
|---|---|
| **Environmental** | • An Assessment of Environmental Effects (AEE) required under NZ environmental legislation was completed previously for the Escarpment Project with regulatory permits granted in June 2014. The Whareatea and Coalbrookdale Blocks are considered to have similar effects, but will require lodgment of a new AEE and new consents prior to development. |
| | • Mining access from DOC was granted for the Escarpment Mine up to a buffer for Trent Stream on 23 May 2013. Whareatea, Coalbrookdale and Escarpment blocks west of Trent stream, and the new proposed road coal transport road from Escarpment to the CHPP require access arrangements from the landowners. |
| | • BRL was assisted by several specialist consults in completing a suite of environmental and site management plans to meet conditions of resource consent for the Escarpment Mine Project. These plans are publically available. Golder considers these documents to be relevant to expected methods and procedures that would be developed for EXP. |
| | • Detailed design and comprehensive water management plans have been finalized. The planned access road upgrade has been completed. Development started in July 2014 but subsequently was largely put on hold in response to a market downturn. Minor stripping and initial water management development are ongoing. |
| | • Required additional baseline studies and applications for permits and access have not be initiated. BRL plans to initiate these at the next study level if the project proceeds. |
| | • Approval must be obtained from Solid Energy New Zealand Ltd. (SENZ) for planned waste disposal inside the adjacent Sullivan CML. |
| | • Overburden rock is potentially acid generating (PAG). Specific management requirements include monitoring, drainage infrastructure, capping and water treatment in order to meet expected regulatory requirements. BRL has completed an AMD Management Plan for the Escarpment Project in collaboration with specialist consults. This plan is presumed to be relevant for management to EXP. |
| | • The project is considered to affect amenity, landscape and ecological values on the Denniston Plateau. High value areas were avoided in the PFS design as far as practicable in consideration of snails, kiwi and rare flora. These will require further consideration at the next study level. Consent conditions and mitigation of effects will require significant effort in progressive and end of mine life rehabilitation. This is expected to be similar to those imposed on the Escarpment project. |
| *Infrastructure* | • Access to Escarpment Mine has already been established and an upgrade completed as part of initial development to date. A new coal transport road must be designed and constructed from Escarpment ROM stockpile area to the CHPP site. The Denniston – Stockton road will be an estimated 19.7 km in length and constructed to accommodate up to 60t off-highway road trucks. Of this length, 7.0 km of new construction will be required and 12.7 km will be either on Stockton mine haul roads (6.8 km), or on upgraded existing access roads (5.9 km). |
| | • Allowance has been in project cost estimation for sustaining capital expenditure for fixed infrastructure owned by BRL |
| | • Electrical Power: |
| |    o EXP is near existing power line infrastructure (110 kV and 11 kV) owned by Transpower and Buller Electricity. Power requirement have been estimated based on the existing Escarpment Mine, with additional allowance for water management at the Whareatea Block and Sullivan North expit waste disposal area |
| |    o The existing 11 kV supply to Mt Rochfort repeater is rerouted in two stages to accommodate the planned mining sequence in the WHW pit. Specific design and consultation will be required at next study level. |
| | • Offices, ablutions block, workshop and store detail design for Escarpment for up to production rate 500 ktpa, factoring assumed for 750 kpta base case. |
| | • Fuel single central location at Escarpment, tanks supplied by a contracted supplier, factoring applied for 750 ktpa case. |
| | • Mining development includes waste and coal haul roads between elements, ROM, waste disposal and soil stockpiles. |
| | • Explosive Magazine assumed supplied as part of an explosives contract. |
| | • Labour, services and accommodation readily available at time of this report in Westport located 16 km east north east or other small towns and hamlets located |

| Criteria | Commentary |
|---|---|
| | along the coastal strip.<br>• KiwiRail Holdings Ltd. operates the existing rail line on coastal strip, Golder understands that the line has the capacity currently to meet the proposed EXP export coal production. |
| **Costs** | • Annual mine operating costs and capital requirements have been estimated to reflect the project mine plan and production schedules. Capital and operating costs were estimated by accepted standard means for the PFS Escarpment Mine detail design, based a combination of factored costs, bench marking similar nearby operations, and quotations from suppliers.<br>• Coal transport costs were estimated as unit cost per tonne based on local contractor quote. The development cost of road extension from Escarpment ROM stockpile area to the CHPP was adapted from costs incurred on a recent previous upgrade of access road to Escarpment using Golder's local experience.<br>• Rail transport cost and Lyttelton port handling charges were based on a quote received from KiwiRail and bench marked with other nearby operations.<br>• Mining costs were estimated based on actual mining contractor costs from existing BRL operations at Escarpment and Cascade Mines, bench marked with other operating mines in the region and supplier/contractor quotes.<br>• Water treatment and mine closure costs were estimated by factoring of Escarpment costs completed at detail design stage. Treatment plants were assumed to be required for Escarpment, Sullivan and Whareatea Block later stages.<br>• Post closure aftercare was assumed for the purposes of this study to be included in a bond required to be posted in favor of the West Coast and Buller District Councils as condition of consent and to DOC as condition of access arrangements.<br>• Three main royalties were accounted for in the cost model; Crown (New Zealand Petroleum and Minerals 2008), site specific rate of 1.40/t for hard to semi hard coking coal and 0.80/t for thermal coal; Mine Rescue and Energy Levy of 2.00 $/t; a private royalty agreement with L&M mining has been allowed for in the cost model. |
| **Revenue factors** | • Refer to Sub section entitled "Market assessment"<br>• Commodity and capital prices were quoted in New Zealand dollars (NZ$). |
| **Market assessment** | • Escarpment and Whareatea resources have been designated a market product type on the basis of a boundary separating maximum vitrinite reflectance (RoMax) above and below 1.0%.<br>    o High RoMax coal (>1.0%) is assigned a hard coking coal (HCC) benchmark price;<br>    o Low RoMax coal (<1.0%) is assigned a semi-hard coking coal (SHCC) price.<br>    o All Whareatea resources fall into the HCC category and most, but not all Escarpment resources fall into the SHCC category.<br>• Options to produce a single blended product from Escarpment and Whareatea resources have been assessed. There is considered a high risk that a single-product Denniston blend would not be valued by the market as equivalent to a HCC, and that operational and infrastructure cost benefits would not offset lower price and other market risks.<br>• Option to combine and blend coal from Escarpment and Whareatea with production from other West Coast producers offer advantages to EXP, primarily in terms of reduced market and revenue risk, as well as reducing required investment in coal processing and transport infrastructure by using available capacity in existing systems.<br>• Dunstone Coal Technology Pty Ltd, September 2015 provided analysis of the synergies of blending EXP coals with other West Coast coals as follows:<br>    o The metallurgical coals from the West Coast are well known, accepted in the international market, and as with most coals, have certain sub-optimal properties which impact the price and acceptance in some markets.<br>    o Currently two West Coast products, NZCC and NZSHCC are sold into international markets. The Escarpment and Whareatea deposits generally have properties that are complementary to these products.<br>    o The addition of Whareatea and Escarpment HCC coal to the NZCC blend would |

| Criteria | Commentary |
|---|---|
| | improve coking properties; increase RoMax; reduce sulphur, but with an increase in ash content. However this product would still be seen as a medium ash coal in international markets. |
| | o Escarpment SHCC offers improvements to coal fluidity and sulphur relative to NZSHCC. The addition of Escarpment SHCC to the NZSHCC blend may achieve a possible lower grade hard coking coal classification as supplies of Australian high volatile matter hard coking coal are reduced with the closure of the Gregory mine. |
| | o Other quality characteristics such as the high proportion of vitrinite and favourable ash chemistry, including low phosphorous) are similar to the Stockton and other West Coast coals. |
| | • Product moisture above 10% can be expected to be looked upon unfavourably by potential customers. A price penalty is expected for total moisture levels above 12%. Current performance of the Stockton CHPP indicates that moisture levels less than 12% for washed coal from Escarpment and Whareatea should be achievable, however this remains an area of uncertainty. Golder considers confirmation of the performance of this coal through the Stockton CHPP to be a high priority for the next level of study. |
| | • World metallurgical coal supply currently exceeds demand and the commodity price is considered low. A long term HCC coal price of USD150 per tonne has been used to assess project economics, consistent with RBC Capital Markets, Global Metals and Mining Q4 2015 Outlook. A long term SHCC price assumption of 80% of the HCC price has been used (USD120 per tonne). |
| | • Total production of 750 ktpa from Escarpment and Whareatea, plus expected future production from Stockton is consistent with sales levels of recent years, and is within the transport and processing capacity for existing processing, transport and port infrastructure. |
| ***Economic*** | • A discounted cash flow analysis was conducted to assess the potential reserves under the economic assumptions used. Discount rate used was 8% after tax. |
| | • Considering only Measured and Indicated resources within the PFS mine design, the project is shown to be marginally economic with an NPV of $2M. In this assessment, a zero benefit was assigned to Inferred and unclassified resources and they were treated as a waste material. This indicates that the PFS design, although not optimal, is economic, and therefore supports the stated mineral reserve. |
| | • In the PFS design, BRL has chosen to accept a risk that the inferred resources may not eventually be converted to Proven and Probable. This would reduce the margin on the project if the Inferred resources do not materialize as planned. |
| | • Analysis which adds Inferred coal resources to the Measured and Indicated resources, yields a project NPV of $141M (IRR 15%). |
| | • Sensitivity analyses have been undertaken for key input parameters including coal wash plant recovery, coal sale price, FOREX rate and mining and processing cost, and inclusion of Inferred resources. |
| | o The project profitability is sensitive to coal recovery and coal sale price. |
| | o The project profitability may be sensitive to low eventual conversion rate of inferred resource to Proven and Probable reserves, if other variables also change unfavourably. |
| | • Startup CAPEX is estimated to be $39 million NZD |
| | • Life of Mine CAPEX is estimated to be $90 million over the twenty year project life. |
| | o A 20% contingency in included in the CAPEX estimate. |
| | • The FOREX rate applied is consistent with ANZ long range forecasts. |
| | • The project is sensitive to CHPP performance assumptions which are based on limited sampling. |
| ***Social*** | • Interested stakeholders considered include: |
| | o Local communities |
| | o Ngati Waewae (Local indigenous group with legal status, referred to as Iwi in New Zealand) |
| | o Regulatory authorities West Coast Regional and Buller District Councils |
| | o West Coast Development Trust |

| Criteria | Commentary |
|---|---|
| | <ul><li><ul><li>Fish and Game New Zealand</li><li>New Zealand Petroleum and Minerals</li><li>Friends of the Hill (Local NGO interested in the project)</li><li>Kawatiri Energy Limited</li><li>New Zealand Historic Places Trust</li><li>Department of Conservation</li><li>SENZ</li><li>L&M Mining</li><li>New Zealand Forest and Bird and various other NGO groups</li><li>Transpower and Buller Electricity</li></ul></li><li>There is an agreement in place to retain public access to Mt Rochfort repeater</li><li>The existing Escarpment Mine consent conditions include re-establishment of rivers and boulder fields to mimic previous pavement areas, reinstatement of previous 4x4 or other walking tracks impacted within the mining footprint.</li><li>EXP is expected to be subject to similar consent conditions consent. These were allowed for in economic analysis.</li></ul> |
| *Other* | <ul><li>Three primary project approvals required are;<ul><li>Mining permit under the Crown Minerals Act 1991,</li><li>Consents from the West Coast Regional Council and the Buller District Council under the Resource Management Act 1991 (RMA),</li><li>An access arrangement and concessions for activities from the Minister of Conservation in respect of activities on the Department of Conservation (DOC) lands (BDA 2013).</li><li>Land not administered by DOC, and not owned by BRL, will also be subject to an access arrangement with the landowner.</li></ul></li><li>The project is located primarily on land within the Mt Rochfort Conservation Area that is administrated by the DOC. The authority for access for the first stage of development was granted for the Escarpment MP area up to the Trent Stream.</li><li>The Coalbrookdale area has an access arrangement in place for two underground mines and associated surface infrastructure. Additional access arrangements/ concessions are required for the proposed surface mine expansion west of Trent stream, for Whareatea and Coalbrookdale blocks.</li><li>An arrangement exists with the holder of the adjacent Coal Mining License (CML) 37-161, SENZ for use of the existing access road for transport of Escarpment Mine coal off the Denniston Plateau. Additional arrangements are required for EXP for use of the CML for waste disposal and associated haulroad access, and the proposed new coal haul road from Denniston to the Stockton CHPP that crosses several permit and license areas (Figure 1, attached).</li><li>The proposed expansion also includes parts of the Coalbrookdale underground mine but excludes the Coalbrookdale Fanhouse and associated public track listed as Category 1 with the NZ Historic Places Trust.</li></ul> |
| *Classificatio n* | <ul><li>The total proportion of Probable Ore Reserves which have been derived from Measured Mineral Resources within the EXP economic pit extents, is 46%. This is primarily attributed to the uncertainty associated with coal recovery estimates for the coal processing plant.</li><li>Reserve coal tonnages reported have been converted from Measured and Indicated Resources only. The PFS mine schedule includes some Inferred resources within the economic pit limits. This is considered reasonable because the economic analysis supports declaration of a mineral reserve. Refer to the sub section entitled "Economic".</li><li>The result appropriately reflects the Competent Person's view of the deposit.</li></ul> |
| *Audits or reviews* | <ul><li>No audits have been performed at the time of reporting the PFS results.</li></ul> |

| Criteria | Commentary |
|---|---|
| *Discussion of relative accuracy/ confidence* | • BRL currently operates the nearby Cascade on the Denniston Plateau and also several mines elsewhere in the South Island supplying domestic thermal markets; Takitimu, Coaldale and Canterbury Coal mine. The conditions on the Plateau, stakeholder and regulatory and mining processes and environment are well understood. |
| | • The reserve estimate is based on a robust resource and reserve modelling process however the accuracy of the estimates should be validated by more detailed studies and is subject to risks as discussed below. |
| | • Golder believes that assumptions made in the PFS are reasonable and achievable by a well operated and managed operations. Risks and uncertainties identified in the PFS should to be used for the purposes of guidance in further feasibly studies and detailed design. |
| | • The key risks and areas of uncertainty identified are: |
| |    o Uncertainty in future coal sale price, as well as historic market volatility. |
| |    o Potential for lower than estimated wash plant yields, particularly for Whareatea, is a major risk. Sensitively analysis results show economic breakeven at 88% of forecast yield. Whareatea coal washability and product ash levels requires further washability testing programmes to confirm performance of this coal through the Stockton CHPP (ash, yield and moisture*). Golder considers that further float sink test and review of plant design requirements should be undertaken as soon as is practical as this is expected to have a significant impact on project success.* |
| |    o Higher than expected product moisture due to coal processing may result in higher production costs or delays, mitigations will depend on tonnages and the blending strategy at time of production. |
| |    o Estimated uncertainty for depletion from previous underground worked areas in Escarpment is +/- 10%. This correspondingly affects remaining coal quality estimate. Local historic production numbers are unavailable and few available records that accurately place the UG workings location within the coal seam. This may result in lower than estimated Reserves, delays in production and safety issues. Void mapping and management, use knowledge gained from nearby operations, reconciliation of recovery against model once operating is key. |
| |    o Possible reserves loss due to conditions of consent, buffer or standoff required; along Escarpment plateau edge, Whareatea River, ecological or additional mine heritage areas (a 50 m buffer applied from Category 1 areas, Coalbrookdale Fanhouse and public walking track, included in PFS). |
| |    o Greater dilution than estimated due to presence of underground workings Escarpment, high ash partings Whareatea, will require high capability coal winning operators and coal quality support team. Possible implementation of sophisticated coal quality modelling and GPS control systems may provide improved performance. |
| |    o A key assumption in the PFS is that the Stockton CHPP facility currently owned and operated by SENZ will be available. This assumption used in the PFS is associated with a degree of uncertainty based on put SENZ being under Voluntary Administration as of 13 July 2015, with assets to be potentially sold within a 2.5 year timeframe, irrespective of the plant owner availability would also rely on successful contract negotiations. However significant synergies exist for all parties in terms of fully utilising existing infrastructure. The complementary coal quality of Escarpment and Whareatea with other West Coast coals may create further opportunities. |
| |    o The EXP project requires a number of approvals and agreements in order to extend the mine into the eastern extremity of Escarpment and into Whareatea. Access agreements will be required to operate in the Coalbrookdale Mining Permit area and Sullivan CML, as well as agreements required for the development of coal transport infrastructure (KiwiRail siding near Waimangaroa and road to Stockton CHPP), in order to proceed. The PFS assumes that all agreements will be obtained. The PFS assumptions consider the experience from Escarpment and have incorporated some aspects into the design process in order to reduce adverse impacts however failure of any one of these approvals impact projects ability to proceed, and potentially cause development |

| Criteria | Commentary |
|---|---|
| | delays, additional costs or other negative impacts to the project. The permitting process for the Escarpment mine was a lengthy process. |
| |  o Access to the Sullivan CML (currently owned by SENZ) is key to allow a cost effective waste disposal areas for the Whareatea block. |
| |  o The control of AMD and post closure water treatment requirements will be dependent on the effectiveness of material management and capping construction methodologies. |
| |  o The pit limits are in many areas bounded by the coal outcrop. Mining on the escarpment edge will require careful planning and further geotechnical assessment. |
| | • There is no actual production data available as PFS level study, relevant production from the adjacent Escarpment Mine limited use as mine still in development stage at time of this report. |

Escarpment Extension Project Location Map

**Tasman Sea**

Port Taranaki

**Project location**
Westport

Wellington

Christchurch
Port Lyttleton

**Pacific Ocean**

0    200    400
Km

Ngakawau

Granity

Stockton
Coal handling &
processing plant

Waimangaroa

**Deep Creek**

Kiwi Rail

Fairdown

Westport

Highway 67

**Sullivan**

**Whareatea West**

**Coalbrookdale**

Denniston Plateau

**Escarpment**

**Cascade**

**Buller Region**
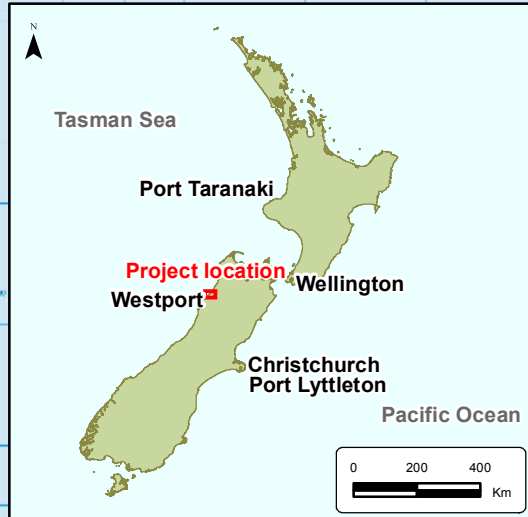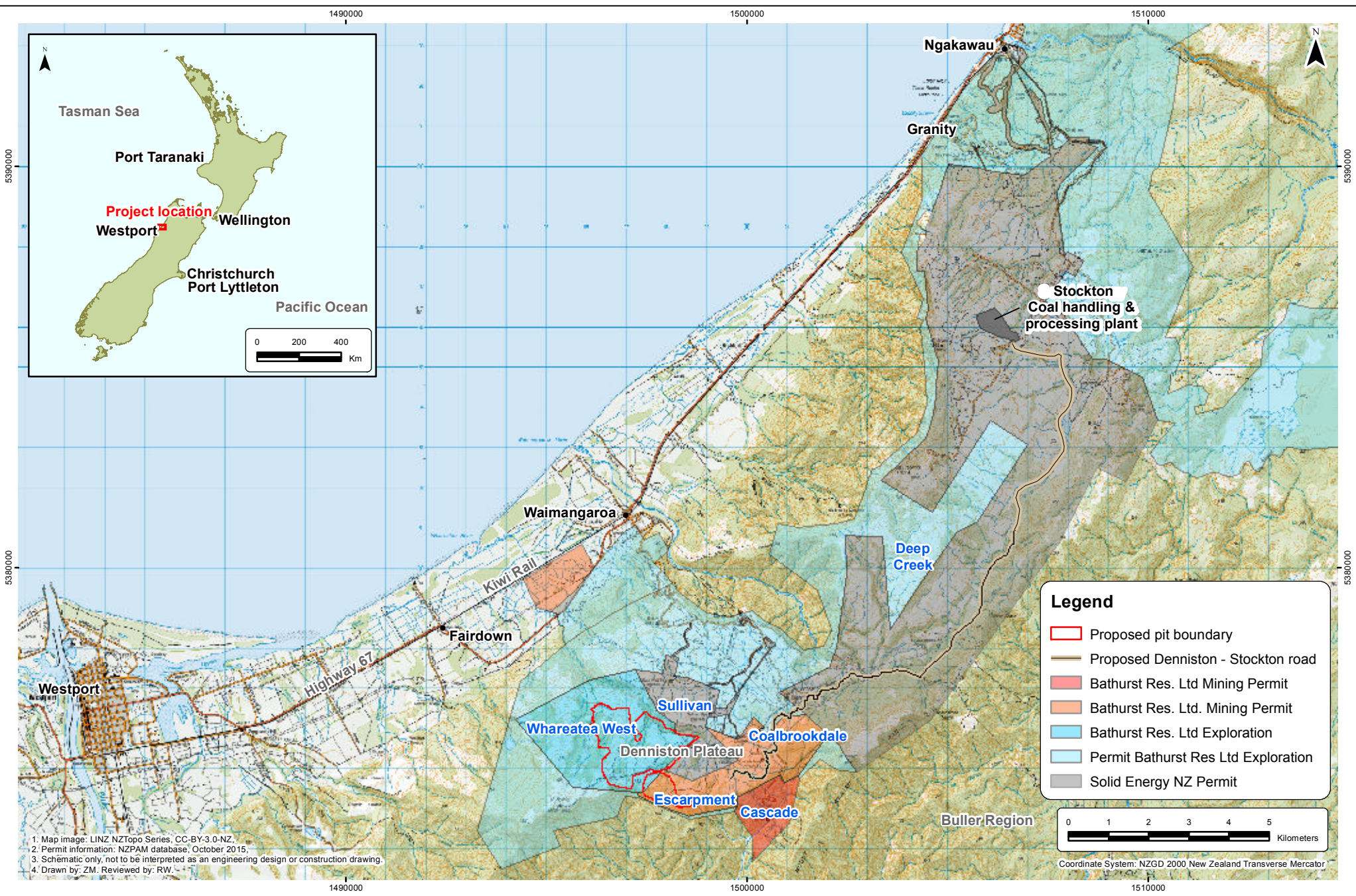
**Legend**

Proposed pit boundary

Proposed Denniston - Stockton road

Bathurst Res. Ltd Mining Permit

Bathurst Res. Ltd. Mining Permit

Bathurst Res. Ltd Exploration

Permit Bathurst Res Ltd Exploration

Solid Energy NZ Permit

0   1   2   3   4   5
Kilometers

Coordinate System: NZGD 2000 New Zealand Transverse Mercator

1. Map image: LINZ NZTopo Series, CC-BY-3.0-NZ,
2. Permit information: NZPAM database, October 2015,
3. Schematic only, not to be interpreted as an engineering design or construction drawing.
4. Drawn by: ZM. Reviewed by: RW.

Golder Associates

BATHURST RESOURCES LIMITED

TITLE  Escarpment Extension Project Location Map

**OCTOBER 2015**

**1**

PROJECT  1378301143

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# JORC Code, 2012 Edition – Table 1 Report for the Denniston Plateau 2016

## Section 1 Sampling Techniques and Data

| Criteria | Commentary |
|---|---|
| **Sampling techniques** | <ul><li>Multiple campaigns of data acquisition have been carried out on the Denniston Plateau over the past century.</li><li>Modern exploration campaigns include data from 2010:<ul><li>280 PQ-HQ triple tube core (TTC) holes</li><li>96 production blast holes</li><li>13 outcrop trenches</li><li>Down-hole geophysics are available for 185 of these modern drill holes.</li></ul></li><li>Historic data includes<ul><li>5 reverse circulation holes 2009-2010</li><li>67 PQ-HQ TTC holes from 1984-2010</li><li>23 NQ TTC holes from 1975-1978</li><li>74 rotary wash drill holes from 1948-1961</li><li>3 outcrop trenches</li><li>49 historic drill holes of various drilling methods</li><li>40 holes of this dataset have down-hole geophysics data available</li></ul></li><li>Recent drilling has aimed to infill areas lacking data and to test reliability of historic data. Drilling has been concentrated on areas deemed closer to production therefore tighter drill spacing exists in Cascade and Escarpment than Whareatea West and Coalbrookdale.</li><li>Coal sampling was based the standardised Bathurst Resources Ltd (BRL) coal sampling procedures.</li><li>Coal quality ply samples have been selected on all coal logged by a geologist with 95% confidence that the ash will fall below 50%. Material with an estimated ash over 50% was not sampled unless the material was a sandstone parting of < 0.1m in thickness within a coal seam whereby it would be included within a larger ply sample.</li><li>Ply samples were generally taken over intervals no greater than 0.5m.</li><li>All analytical data has been assessed and verified before inclusion into the resource model.</li></ul> |
| **Drilling techniques** | <ul><li>All BRL managed drilling campaigns have utilised the following drilling methods<ul><li>Full PQ Triple Tube Core (TTC)</li><li>HQ Triple Tube Core only where necessary</li><li>Open-holed overburden where applicable</li><li>Logged production blast holes using top head hammer blast rig.</li></ul></li><li>Historic drilling techniques include<ul><li>PQ Triple Tube Core</li><li>HQ Triple Tube Core</li><li>NQ Triple Tube Core</li><li>Open-holed</li><li>Rotary wash</li><li>Reverse circulation</li></ul></li><li>All exploration drill holes were collared vertically</li><li>PQ sized drilling was utilised to maximise the core recovery</li></ul> |
| **Drill sample recovery** | <ul><li>Core recovery was measured by the logging geologist for each drillers' run (usually 1.5m) in each drill hole. If recovery of coal intersections dropped below 85% the drill hole was redrilled. Drillers were paid an incentive if coal recovery was above 90%.</li><li>In some instances the recovery of thin rider seams (< 0.5m) was poor due to the soft friable nature of the coal. Therefore the sample dataset for the two rider seams was not as evenly spatially distributed as the main seam.</li><li>Average total core recovery over the modern drilling campaigns was 95.6% with core recovery of coal at 93.6%.</li><li>Where small intervals of coal were lost, and was confirmed by geophysics, ash values were estimated using the results of overlying and underlying ply samples and the relative response of the open-hole density trace.</li></ul> |

| Criteria | Commentary |
|---|---|
| | • Geochemical sampling for overburden characterisation was also completed by taking representative samples of core on a lithological basis with a maximum sample length of 5m. |
| *Logging* | • BRL has developed a standardised core logging procedure and all core logging completed by BRL and its contractors has followed this standard.<br>• All modern drill core has been geologically and geotechnically logged by geologists under the supervision and guidance of a team of experienced exploration geologists.<br>• As much data as possible has been logged and recorded including geotechnical and rock strength data.<br>• All core was photographed prior to sampling. Depth metre marks and ply intervals are noted on core in each photograph.<br>• The geophysical logging company maintained and calibrated all tools as per their internal calibration procedures. Additionally, geophysics equipment was calibrated and tested using a calibration hole on the plateau with known depth to coal, thickness and quality.<br>• BRL aimed to geophysically log every drill hole that intersected coal providing hole conditions and operational constraints allowed. The standard suite of tools run included density, dip meter, sonic, and natural gamma.<br>• Where drill hole conditions were poor or mine workings were intersected only in-rods density was acquired. In-rods density produced a reliable trace for use in seam correlation and depth adjustment but was not used for ash correlations.<br>• Down hole geophysical logs were used to aid core logging. Down hole geophysics were used to correlate coal seams, to confirm depths and thickness of coal seams and to validate drillers' logs. Geophysics were also used to accurately calculate recovery rates of coal. |
| *Sub-sampling techniques and sample preparation* | • For all exploration data acquired by BRL, an in-house detailed sampling procedure was used. Sampling and sample preparation were consistent with international coal sampling methodology.<br>• Ply samples include all coal recovered for the interval of the sample. Core was not cut or halved. Ply sample intervals were generally 0.5m unless dictated by thin split or parting thickness.<br>• All drilling in the recent campaigns has been completed using triple tube cored holes. No chip or RC samples were taken in these campaigns. Some historic RC and wash drilled holes have poor sampling methods and are excluded from the coal quality model.<br>• Assay samples were completed at the core repository after transport from drill site in core boxes. Samples were taken as soon as practicable and stored in a chiller until transport to the coal quality laboratory.<br>• A series of random duplicate samples representing 1.3% of the total number of samples from North Buller has been completed by CRL Energy ltd. The results of this duplicate testing were comparable to that reported by SGS New Zealand Limited (SGS). |

| Criteria | Commentary |
|---|---|
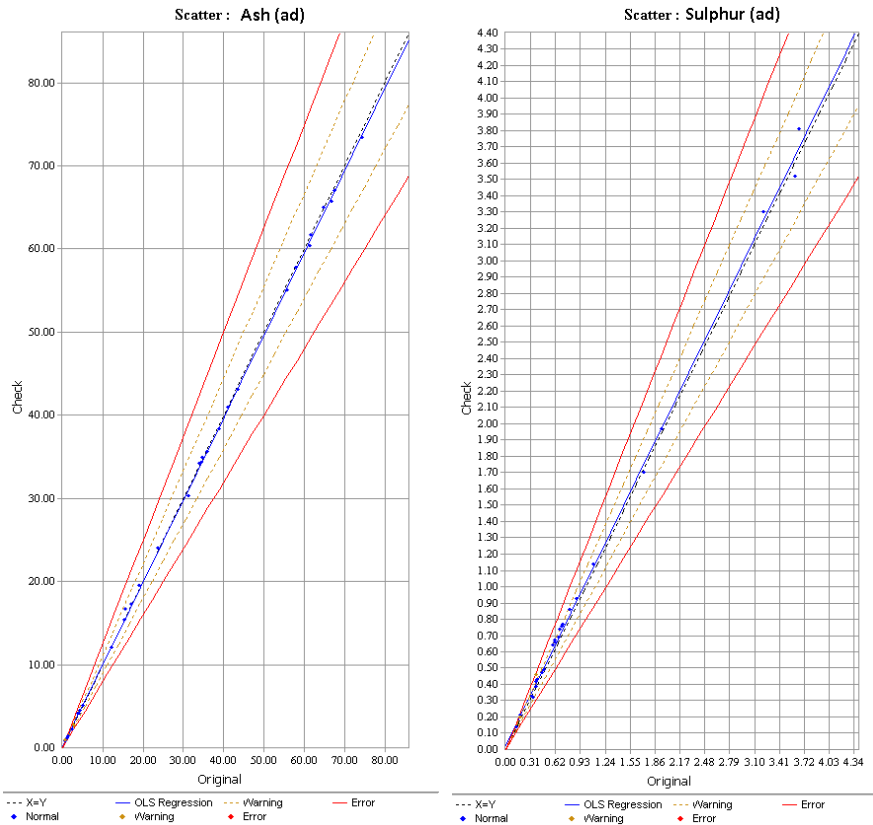


**Figure 1** Scatter graphs showing the consistent results obtained for duplicate samples analysed at SGS (original) and CRL (check).

| | |
|---|---|
| ***Quality of assay data and laboratory tests*** | • All coal quality testing completed for BRL has been carried out by accredited laboratory SGS.<br>• SGS have used the following standards for their assay test work:<br> o Proximate Analysis is carried out to the ASTM 7582 standard<br> o Ash has also used the standard ISO 1171<br> o Volatile matter has also used the standard ISO 562<br> o Inherent moisture has also used the ISO 5068<br> o Total sulphur analysis is carried out to the ASTM 4239 standard<br> o Crucible swell tests are completed using the ISO 501 standard<br> o Calorific value results are obtained using the ISO 1928 standard.<br> o Loss on drying data is completed using the ISO 13909-4 standard.<br> o Relative Density is calculated using the standard AS 1038.21.1.1<br>• CRL completed much of the assay test work for samples collected prior to BRL taking over the projects.<br>• CRL used the following standards for their test work:<br> o Inherent Moisture tests utilised the ISO 117221 standard<br> o Ash tests utilised the ISO 1171 standard<br> o Volatile matter tests utilised the ISO 562 standard<br> o Calorific value tests utilised the ISO 1928 standard<br> o Crucible swelling index testing was carried out using the ISO 501 standard<br>• Both SGS and CRL are accredited laboratories.<br>• BRL has completed a total of 56 composite samples. Composite samples have been tested using the following standards: |

| Test Work | Standard Followed |
|---|---|
| **Loss on air drying** | (ISO 13909-4) |
| **Inherent Moisture** | (ASTM D 7582 mod) |
| **Ash** | (ASTM D 7582 mod) |
| **Volatile Matter** | (ASTM D 7582 mod) |

| Criteria | Commentary | |
|---|---|---|
| | **Fixed Carbon** | by difference |
| | Sulphur | (ASTM D 4239) |
| | **Swelling Index** | (ISO 501) |
| | Calorific Value | (ISO 1928) |
| | **Mean Maximum Reflectance All Vitrinite (RoMax)** | Laboratory Standard |
| | Chlorine in Coal | (ASTM D4208) |
| | **Hardgrove Grindability Index** | (ISO 5074) |
| | GIESELER PLASTOMETER | (ASTM D 2639) |
| | **AUDIBERT ARNU DILATOMETER** | (ISO 349) |
| | FORMS OF SULPHUR | (AS 1038 Part 11) |
| | **ASH FUSION TEMPERATURES** | (ISO 540) |
| | ASH CONSTITUENTS (XRF) | (ASTM D 4326) |
| | **Ultimate Analysis** | Laboratory Standard |

- All analysis was undertaken and reported on an air dried basis unless stated otherwise.

| Criteria | Commentary |
|---|---|
| *Verification of sampling and assaying* | • Sample assay results have been cross referenced and compared against lithology logs and downhole geophysics data. Results are also inspected by experienced geologists and compared with expected values utilising known coal quality relationships for the Buller Coalfield.<br>• Anomalous assay results were investigated and, where necessary, the laboratory was contacted and a retest undertaken from sample residue.<br>• 12 twinned holes have been drilled at the project with consistent results obtained between drill holes.<br>• Laboratory data is imported directly into an Acquire database with no manual data entry at either the SGS laboratory or at BRL.<br>• Assay results files are securely stored on a backup server.<br>• Once validated, drill hole information is "locked within the Acquire database to ensure the data is not inadvertently compromised.<br>• Localised weathering of coal near fault zones or near outcrops can affect coal assay results. There are a number of instances where this has occurred and only ash data from these samples has been retained for modeling purposes. |
| *Location of data points* | • Modern drill hole positions have been surveyed using Trimble RTK survey equipment.<br>• Some historic drill collars have been resurveyed. Some historic collars are not able to be located.<br>• Historic mine plans georeferenced by locating and surveying historic survey marks, survey pegs and mine portals drawn on mine plans.<br>• New Zealand Trans Mercator 2000 Projection (NZTM) is used by BRL for most of its project areas. NZTM is considered a standard coordinate system for general mapping within New Zealand. Historic data has been converted from various local circuits and map grids using NZ standard cadastral conversions.<br>• A LiDAR survey was carried out over the Denniston plateau in December 2011, with a repeat LiDAR survey flown over Cascade in January 2013. This LiDAR data provided very accurate topographic data used in the model. Contractors' specifications state that, for the choice of sensor and operating settings used for this project, the LiDAR sensor manufacturer's specification states 0.15m (1-sigma) horizontal accuracy and 0.1m (1-sigma) as the open ground elevation accuracy.<br>• Surveyed elevations of drill hole collars are validated against the LiDAR topography and ortho-corrected aerial photography. |
| *Data spacing and distribution* | • Data spacing for the Denniston Plateau project areas has been estimated by calculating the diameter required to fill the total area of the project divided by number of drill holes within that area.<br>• Escarpment has an average drill hole spacing of 114m<br>• Whareatea West has an average drill hole spacing of 257m<br>• Coalbrookdale has an average drill hole spacing of 198m |

| Criteria | Commentary |
|---|---|
| | <ul><li>Cascade has an average drill hole spacing of 76m</li><li>Drill hole spacing is not the only measurement used by BRL to establish the degree of resource uncertainty and therefore the resource classification. BRL uses a multivariate approach to resource classification.</li><li>The current drill hole spacing is deemed sufficient for coal seam correlation purposes.</li><li>Geostatistics have been applied to the Denniston dataset with positive results being obtained. Variography results have been applied to grade estimation search parameters.</li><li>The samples database is composited to 0.5m sample length prior to grade estimation. Any samples with composited length of less than 0.1m are not included in the estimation. Compositing starts at the top of seam and small samples are not distributed or merged.</li></ul> |
| *Orientation of data in relation to geological structure* | <ul><li>All exploration drilling has been completed at a vertical orientation. Deviation data was acquired by BRL during modern campaigns and showed little to no deviation in those holes. Holes without deviation plots are assumed to be vertical.</li><li>Any deviation from vertical is not expected to have a material effect on geological understanding as the average drill hole depth in the dataset is 65m with the deepest coal intersection of 131m (at 60m depth a 1° deviation would produce a horizontal deviation at the end of hole of 1m with negligible vertical exaggeration).</li><li>The majority of the deposit presents a shallow seam dip between 5° – 15°.</li><li>Vertical drilling is considered to be the most suitable drilling method of assessing the coal resource on the Denniston Plateau.</li></ul> |
| *Sample security* | <ul><li>Stringent sample preparation and handling procedures have been followed by BRL. Ply samples are collected and recorded from drill core, bagged and placed within a locked chiller prior to being dispatched for analysis.</li><li>It is not considered likely that individual coal samples face a risk of theft or sabotage as coal is a bulk commodity with little value for small volumes of coal from drill core.</li></ul> |
| *Audits or reviews* | <ul><li>BCL has reviewed the geological data available and considers the data used to produce the resource model is reliable and suitable for the purposes of generating a reliable resource estimate.</li><li>Results of a duplicate sample testing program comparing SGS and CRL results for ply assays have shown a strong correlation with no laboratory bias.</li><li>Senior geologists undertake monthly audits of the sample collection and analysis.</li></ul> |

## Section 2 Reporting of Exploration Results

| Criteria | Commentary |
|---|---|
| *Mineral tenement and land tenure status* | • BCL owns and operates a number of coal exploration and mining permits on the Denniston Plateau, northwest of Westport, New Zealand.<br>• BRL has 100% ownership in the following coal permits on the Denniston Plateau:<br><br><table><tr><td>**Permit**</td><td>Operation</td><td>Expiry</td></tr><tr><td>**Mining Permit 51279**</td><td>Escarpment</td><td>23/06/2022</td></tr><tr><td>**Mining Permit 41456**</td><td>Coalbrookdale</td><td>14/05/2017</td></tr><tr><td>**Mining Permit 41332**</td><td>Coalbrookdale</td><td>14/05/2015</td></tr><tr><td>**Mining Permit 41274**</td><td>Coalbrookdale</td><td>29/05/2035</td></tr><tr><td>**Mining Permit 41455**</td><td>Cascade</td><td>14/05/2017</td></tr><tr><td>**Exploration Permit 40591**</td><td>Whareatea West</td><td>19/12/2015</td></tr><tr><td>**Exploration Permit 40628**</td><td>Buller</td><td>10/01/2015</td></tr></table><br>• BRL have submitted an application for a subsequent Mining Permit to replace EP40591 and it is reasonably expected that this permit application will be granted<br>• An appraisal extension application (AE) for EP40628 and an extension of duration for MP41332 have been submitted to NZP&M and the application is currently being processed. It is reasonably expected that these permit applications will be granted<br>• The Denniston Plateau Resource Model covers the Sullivan Coal Mining Licence 37161 (underground) and Ancillary Mining Licences 37161-2, and 37161-3. These three permits are owned by Solid Energy NZ Ltd (SENZ). No resources have been reported within these areas.<br>• A royalty payment to the Crown is payable on all coal mined from the Plateau at a rate of $2 per tonne.<br>• The acquisition of the Coalbrookdale permits includes a life of mine royalty based on a fixed percentage of FOB revenue.<br>• The majority of the land on the Denniston Plateau is Crown land administered by the Department of Conservation as Stewardship Areas (Part V Section 25 Conservation Act 1987). These areas are managed to protect the natural and historic values of the region. Stewardship areas can be disposed of, but disposal is subject to a public process and it must be clear that their retention and continued management would not materially enhance the conservation or recreational values of adjacent land.<br>• An access arrangement for the Escarpment project was granted by the Minister of Conservation in May 2013.<br>• Bathurst was granted resource consents for the Escarpment project by an independent panel of commissioners representing the local councils in August 2011. These resource consents were then the subject of a number of appeals. The final consents were granted in October 2013.<br>• Production from Escarpment began in 2014 and the mine was placed in care and maintenance in May 2016.<br>• The intent of the company is to continue to compete for other markets for this high quality coal and the company is continuing to develop plans for the export operation. |
| *Exploration done by other parties* | • Historic geological investigations and reports for Denniston exist, covering much of the past 125 years.<br>• The Historic drilling database includes the following drill holes compiled from the historical data records. |

| Criteria | Commentary |
|---|---|

**Table 1  Table listing historic drilling dataset.**

| Years | Agency | Range of Collar ID | # Holes | Drilling Method | # Holes in structure model | # holes in quality model | # holes with Geophysics Available |
|---|---|---|---|---|---|---|---|
| Multiple | Various | 200 - 254 | 49 | Various | 36 | 1 | 0 |
| 1948 – 1950 | State Coal Mines | 525 – 569A | 47 | Rotary wash drill | 44 | 32 | 1 |
| 1950 – 1951 | State Coal Mines | 750 - 895 | 7 | Rotary wash drill | 5 | 3 | 0 |
| 1957 – 1961 | State Coal Mines | 916 - 984 | 20 | Rotary wash drill | 16 | 2 | 0 |
| 1975 – 1978 | State Coal Mines | 1070 - 1142 | 23 | NQ triple tube core/open hole | 20 | 12 | 0 |
| 1984 – 1986 | Applied Geological Associates (AGA) | 1270 - 1495 | 21 | Open hole CSR and triple tube core | 16 | 8 | 14 |
| 1997 | Solid Energy NZ Ltd | 1509 - 1512 | 4 | PQ wash drill and triple tube core | 2 | 2 | 4 |
| 2005 | Eastern Corp | CC01 – CC07 | 7 | PQ wash drill and triple tube core | 2 | 1 | 1 |
| 2005 – 2006 | Eastern Corp/ Restpine | WW01 – WW11 | 11 | PQ wash drill and triple tube core | 11 | 9 | 8 |
| 2007 | L&M Coal | DEN01 – DEN05 | 5 | HQ wash drill and triple tube core | 5 | 4 | 4 |
| 2008 | L&M Coal | DEN01A – DEN09 | 8 | PQ wash drill and triple tube core | 5 | 4 | 4 |
| 2009 – 2010 | Eastern Corp | CC08 - CC12 | 5 | RC | 3 | 2 | 0 |
| 2009 – 2010 | L&M Coal | DEN10 – DEN18 | 11 | PQ wash drill and triple tube core | 11 | 5 | 6 |
| 2010 | L&M Coal | Various | 3 | Trenches | 3 | 3 | 0 |

- All historic data has been checked and validated against original source documents by L&M, Golder Associates (NZ) Ltd and again by BRL staff post acquisition of the project. Where data was deemed unreliable it was removed from the relevant resource model dataset.

| Criteria | Commentary |
|---|---|
| *Geology* | - The project is located in the Buller coal field, New Zealand.<br>- The Denniston Plateau is a north west dipping plateau bounded to the west by the Papahaua Overfold / Kongahu Fault zone, and to the east by the Mt William Fault.<br>- The defined resource is contained within the Eocene aged Brunner Coal Measures. The coal measures consist of a fluviatile sequence of fine to very coarse sandstones, siltstone, mudstone and coal seams. The deposit generally has a single extensive seam with some localised splitting of the seam. The coal thickness can be up to 12m but generally averages 4-5m vertical thickness.<br>- The dip of the plateau reflects the dip of the coal bearing sediments with localised exposures of basement units at structural highs and within incised gullies.<br>- Little to no Quaternary deposits or soils overlay the Brunner Coal Measures with overburden generally around 40-50m.<br>- A strong trend in coal rank exists across the deposit with coal rank increasing from east to west. |

| Criteria | Commentary |
|---|---|
| *Drill hole Information* | **Table 2 Table listing modern drilling dataset.** |

| Years | Agency | Range of Collar ID | # Holes | Drilling Method | # Holes in structure model | # Holes in quality model | # holes with Geophysics Available |
|---|---|---|---|---|---|---|---|
| 2010 - 2012 | Rochfort Coal | WW12 - WW25 | 14 | PQ OH and Triple tube Core | 14 | 13 | 12 |
| 2011 - 2016 | Buller Coal | DEN19 - DEN263 | 244 | PQ OH and Triple tube Core | 215 | 206 | 156 |
| 2011 - 2013 | Cascade Coal | CC13 - CC46 | 32 | HQ/PQ OH and Triple tube Core | 21 | 19 | 25 |
| 2012 | Cascade Coal | CCT01 - CCT02 | 2 | Trenches | 2 | 2 | 0 |
| 2012 - 2016 | Buller Coal | DENT01 – DENT29 | 29 | Trenches | 28 | 28 | 0 |
| 2012-2016 | Cascade Coal | CCB16 – CCB60 | 59 | Logged Production Blast holes | 50 | 0 | 2 |
| 2013-2016 | Buller Coal | DENB001 – DENB184 | 184 | Logged Production Blast holes | 81 | 3 | 0 |

- Exploration drilling results have not been reported in detail.
- The exclusion of this information from this report is considered not to be material to the understanding of the report.

| Criteria | Commentary |
|---|---|
| *Data* | - Exploration drilling results have not been reported in detail. |

| Criteria | Commentary |
|---|---|
| *aggregation methods* | • The maximum ash cut off for the building the Denniston structure model was set at 50%, however some thin assay samples where ash is greater than 50% are included in the coal quality dataset due to the structure model including that interval within a coal seam.<br>• Resources have been reported with an ash cutoff of 45%. |
| *Relationship between mineralisation widths and intercept lengths* | • All exploration drill holes have been drilled vertically and the coal seam is generally gently dipping. Therefore seam intercept thicknesses are representative of the true seam thickness.<br>• Dip metre and deviation plots are available for some holes. For those without this data it is assumed that a vertical orientation is achieved and, as most coal intersections are less than 100m in depth, any deviation from vertical would produce only a very minor effect to the reported depth to coal and coal thickness. |
| *Diagrams* | • The Appendix includes a number of plans that display the deposit geographically. |
| *Balanced reporting* | • Exploration drilling results have not been reported. This has avoided any issues with unbalanced or biased reporting.<br>• The Competent Person does not believe that the exclusion of this comprehensive exploration data within this report detracts from the understanding of this report or the level of information provided. |
| *Other substantive exploration data* | • Representative bulk samples have been collected and tested for<br>   o Coking behavior<br>   o Material handling properties<br>   o Washability analysis<br>• BRL has completed and compiled a total of 56 coal quality composite samples over the Denniston Plateau.<br>• A number of bulk marketing samples have been completed.<br>• BRL has tested 784 overburden samples for overburden classification for acid forming and neutralising potential. |
| *Further work* | • Further infill drilling is planned for the near future for the eastern side of the Escarpment permit in the 'Brazil Block' to improve the definition of the coal resources within that area.<br>• A thorough coal washability testing programme for the western margin of Whareatea West is planned. |

## Section 3 Estimation and Reporting of Mineral Resources

| Criteria | Commentary |
|---|---|
| *Database integrity* | • All historic and legacy datasets have been thoroughly checked and validated against original logs and results tables.<br>• BRL utilises an Acquire database to store and maintain its geological exploration dataset.<br>• The Acquire database places explicit controls on certain data fields as they are entered or imported into the database such as overlapping intervals, coincident samples, illegal sample values, standardised look-up tables for logging codes etc.<br>• Manual data entry of assay results is not required as results are imported directly.<br>• Drill hole and mapping data is exported directly into Vulcan from Acquire. |
| *Site visits* | • Hamish McLauchlan (the Competent Person) has worked for the past 12 years in the Buller coal field and on the Denniston project for the past 5 years.. |
| *Geological interpretation* | • BRL has confidence in the geological model and the interpretation of the available data. Confidence varies for different areas and this is reflected by the resource classification.<br>• BRL uses a multivariate approach to resource classification which takes into account a number of variables.<br>• BRL considers the amount of geological data sufficient to estimate the resource.<br>• Uncertainty surrounds the historic mine workings, both in the quality and quantity of coal extracted and surveying and positioning of underground workings. This is reflected |

| Criteria | Commentary |
|---|---|
| | in the resource classification |
| | • BRL has used a total of 16 synthetic holes in the structure model primarily to constrain seam thicknesses around the edges of coal pods that have been worked by historical underground mines. |
| | • A quaternary gravel deposit truncates the coal measures as an unconformity within the Cascade valley. This unconformity surface has been incorporated into the resource model. Some uncertainty surrounds the surface and therefore the coal resource within the area of influence. The quaternary gravel deposit only covers an area of ~2.5Ha or < 0.1% of the total resource area, much of which has already been extracted at the Cascade opencast mine. |
| | • Effect of alternate interpretations is minimal when taken as a portion of total resources. |
| | • A small number of digital interpretation strings are used to constrain the coal structure grids within the model. These strings are primarily located near fault boundaries. |
| *Dimensions* | • The main coal seam varies in thickness from less than 1m thick up to 14m thickness locally. |
| | • Depth of cover varies from 0m at outcrop to over 150m at the eastern margin of the Mt William Fault. Inferred and Indicated resources include coal up to 130m below surface, while the measured resource includes coal up to 75m below surface. |
| | • The deposit roughly covers a 6.5km by 4.5km area. The model is bounded by the Escarpment Fault to the south, the Waimangaroa Gorge to the north, and the Mt William Fault to the east. |
| *Estimation and modeling techniques* | • All available and reliable exploration data has been used to create a geological block model which has been used for resource estimation and classification. |
| | • All exploration drilling data is stored in Acquire and exported into a Vulcan drill hole database. |
| | • Mapping data is stored in Acquire and exported into Vulcan. |
| | • A horizon definition has been developed and is used in the stratigraphic modeling process. |
| | • The model is subdivided into four distinct domains, each separated by large faults that dissect the project area. Each area is modeled for structure and grade separately. |
| | • Vulcan 9.0.2 is currently used to build the structure model. Grid spacing is 10m x 10m. This spacing was selected to be 1/5 of the minimum average point of observation spacing within a domain area. |
| | • Vulcan's stacking method was used to produce the structure model. This method triangulates a reference surface (coal roof) and then stacks the remaining horizons by adding structure thickness using inverse distance. |
| | • The maximum triangle length for the reference surface was set to 1400m. |
| | • Based on geostatistics for full seam thickness the maximum search radius for inverse distance is 1500m. The inverse distance power is set to 2, with maximum samples set to 8. |
| | • Structure grids are checked and validated before being used to construct the resource block model. |
| | • Vulcan 9.0.2 is used to build the block model and to grade estimate. The process is automated using a Lava script. |
| | • The coal structure surfaces for each domain, along with LiDAR topography surface, quaternary unconformity surface, and other mining related surfaces for Cascade and Escarpment are used to build the block model. The block dimensions are constructed at 10m x 10m. Vertical thickness for coal blocks is 0.5m, whilst overburden blocks are set to 5m maximum thickness. |
| | • Overburden characterisation for AMD purposes is modeled in a separate estimation step utilising the same stratigraphic structure grids. |
| | • Grade estimation is performed utilising Vulcan's Tetra Projection Model. The main seam, and two discontinuous rider seams in each domain is estimated for ash, sulphur, air dried moisture and in-situ moisture. Volatile matter, crucible swell index, and calorific value are estimated on the ash pass. |
| | • Geostatistics hav been performed on the coal quality dataset to examine and define the estimation search parameters for each variable. The maximum search radius is set to the maximum range of influence found in the semi-variogram for each variable. |
| | • Grade estimation is computed using an inverse distance squared function. |

| Criteria | Commentary |
|---|---|
| | • Various methods have been used to check the validity of the block estimation. This includes manual inspection of the model, QQ plots of the model qualities vs coal quality database and other comparison tools.<br>• Some mining reconciliation has been completed on the resource model to examine model accuracy within the Cascade mining area. To date, the results are within the bounds of expected variability based on resource classification used and mining rates. No other bulk reconciliation has been completed.<br>• Resource tonnages within the model have been discounted where the resource falls within an area of historic underground workings. The primary mining method utilised historically on the Denniston Plateau is bord and pillar mining. Some extraction using a water based coal extraction (hydro mining) when pillaring has also taken place. Three different classifications have been attributed to the historic workings, with each classification having a different extraction rate. Historic extraction rates are estimated using mining extraction reports, and tonnage reports. The extraction rates used to discount coal tonnages in the resource model are as follows:<br><br>  \| Mining Method \| Extraction Rate \|<br>  \|---\|---\|<br>  \| First worked \| 35% \|<br>  \| Pillars extracted \| 53% \|<br>  \| Hydro worked \| 73% \|<br><br>• Behre Dolbear Australia Pty Limited (BDA) notes that Bathurst has adopted a procedure over old workings of discounting the estimated resources to account for the depletion of coal from underground mining and due to possible structures not identified by drilling. Based on reconciliations from mining to date at Takitimu and Cascade, this approach has been established as a reasonably reliable, if somewhat conservative, method of estimating resources where there are clearly areas of depletion. BDA accepts that this appears to be a reasonable approach, but cautions there will be areas where the resources may differ from the estimates. |
| *Moisture* | • Resource tonnages are reported using natural moisture, calculated from air dried relative density, air dried moisture and in situ moisture using the Preston Sanders equation.<br>• Block air dried density is calculated from the block air dried ash value using the ash-density relationship derived from the project dataset.<br>• A fraction (< 0.1%) of blocks were not estimated for moisture and have been assigned average values based on the permit in which the block is located. |
| *Cut-off parameters* | • Structure grids have been developed based on a 50% ash cutoff. Some higher ash samples are retained within the coal quality dataset to allow simplification of the seam model especially in Whareatea West where higher ash partings become more abundant.<br>• No lower cutoff has been applied. There is an inherent minimum limit to ash samples in modern results due to a laboratory detection limit of 0.17%. Ten modern ply samples fall below this detection limit, while a further 62 historic ply samples have ash values at or below this limit.<br>• Coal resources are reported down to a seam thickness of 0.5m (one block) with an ash cutoff of 45%. |
| *Mining factors or assumptions* | • Minimum seam thickness is set at 0.5m or one block in height. Ash cutoff of 45% is used.<br>• No other mining factors such as strip ratios, mining losses and dilutions have been applied when developing the resource model.<br>• Recent Whittle optimizations undertaken by Golder Associates (NZ) Ltd indicate that the majority of the resource is economically recoverable at present using standard opencast mining methods. The remainder (<5%) of the resource would become economically viable if coal prices return to the high prices of the last 5 years. |
| *Metallurgical factors or assumptions* | • BRL's current understanding of coal washability and yields on the Denniston Plateau has driven the determination to use a 45% ash cutoff for reporting resources within the project area. |

| Criteria | Commentary |
|---|---|
| | • No other metallurgical assumptions have been applied in estimating the resource. |
| *Environment al factors or assumptions* | • Open pit mining and coal transport will be conducted amid environmentally and culturally sensitive areas. The proposed mining sites are a likely habitat for endangered snail and kiwi species. High rainfall rates, acid-generating overburden and historical acid mine drainage are all concerns that have been addressed.<br>• Mining within the Escarpment permit has all necessary approvals in place. Similar environmental values occur within the remainder of the Denniston Plateau. It is assumed that any constraints imposed on BRL in terms of environmental protection will not be prohibitive to economic resource extraction.<br>• No other environmental assumptions have been applied in developing the resource model. |
| *Bulk density* | • A total of 580 relative density (air dried) sample results are available for the Denniston project area.<br>• The samples are distributed throughout the project area and the sample set covers a complete range of ash values from <0.17% to 93.5%.<br>• From this dataset an ash-density curve was generated with a co-efficient of determination of $R^2=0.9869$.<br>• After grade estimation, density was then calculated using the block ash value and the derived density equation.<br>• An in-situ density value was then computed using the Preston Saunders method.<br>• Insitu - moisture determinations have been collected from drill core and from bulk samples. |
| *Classification* | • BRL classifies resources using a multivariate approach.<br>• Coal resources have been classified on the basis of geological and grade continuity balanced by relative uncertainties surrounding historic underground extraction and proximity to faults.<br>• Closely spaced drilling with valid samples increases the confidence in resource assessments.<br>• The confidence is reduced by:<br>  o A block being within an underground worked area due to extraction rate uncertainty.<br>  o A block being within 20m of an underground worked area due to uncertainty with historic survey of the workings and georeferencing of mine plans.<br>  o A block is in an area of steep structure dip, usually in areas of large faults.<br>  o A block lies within an area of thin or splitting seam resulting in uncertainty of geological continuity.<br>• If an area is within an area worked by historic underground mines the resource is considered as Inferred as a minimum. |
| *Audits or reviews* | • A comprehensive internal review of the resource model has been carried out by BRL. The 2015 Resource Model represents a major update to the 2012 Resource Model and incorporates all the drilling and exploration data acquired since 2012. |
| *Discussion of relative accuracy/ confidence* | • BDA has reviewed the resource and reserve estimates and has visited the sites of all currently planned operations and the existing mines. BDA has examined the methodology used to estimate the resources and reserves and is satisfied that the processes have been properly conducted. The estimation methodology is generally in accordance with industry practice and BDA considers the estimates can be regarded as consistent with the principals of JORC.<br>• Statistical comparisons between the resource block model and the coal quality data set have been carried out and are within expected ranges. Techniques utilised include QQ plots and probability plots.<br>• Cascade mine utilises the Denniston resource model for mine planning and scheduling. Production reconciliation for the last 12 months showed that ROM coal production was more than 10% in excess of that modeled. |

## Section 4 Estimation and Reporting of Ore Reserves

### Escarpment Domestic

| Criteria | Commentary |
|---|---|
| **Mineral Resource estimate for conversion to Ore Reserves** | • A 3D Resource Block model of topography, structure and quality are used for in-situ resource definition.<br>• Areas where previous underground extraction has taken place were depleted from the model based on historic recovery factors described by BRL in JORC Section 3 of this table.<br>• Mine design blocks are applied to the in-situ resource model to generate the raw reserves used to create a separate mine reserve model.<br>• The mine model also reflects working sections or seam aggregations, mining methods and associated loss and dilution impacts. The mine reserve model is used as the basis for Ore Reserves reporting.<br>• Mineral Resources are exclusive of Ore Reserves.<br>• Escarpment mine was split into Domestic and Export coal for reporting in 2015. |
| **Site visits** | • The Reserves Competent Person, Terry Moynihan of Core Mining Consultants (CMC) visits the site regularly. |
| **Study status** | • Escarpment is a mine project that is currently in care and maintenance. The reportable<br>• Ore Reserve is based on the life of mine plan. It has been determined the mine plan is technically achievable and economically viable, and that material modifying factors have been considered.<br>• Escarpment was previously operating; supplying coal into the domestic (New Zealand) based industrial market.<br>• For JORC Reserves reporting purposes, detailed mine design and schedules are constructed to generate detailed cash flow schedules. This work includes identifying the mining sequence, equipment requirements, and incremental and sustaining capital requirements |
| **Cut-off parameters** | • Pit optimisation runs were completed to determine economic pit limits using BRL supplied cost and revenue data (see **Figure 14)** |
| **Mining factors or assumptions** | • Coal loss and dilution factors are also applied and vary by the equipment type uncovering the various coal seams (i.e. excavator size). Roof and floor coal loss thickness is set at 10cm and roof and floor waste dilution thickness ranges from 0cm–5cm.<br>• Underground (UG) factors are applied in the mining model using triangulations based on digitised historic plans of the underground and surface workings. UG factors applied are as follows: |

| Mining Method | UG Extraction Rate | Mining Loss | Mining Contaminated | Mining Dilution (%) |
|---|---|---|---|---|
| **First worked** | 35% | 10% | 15% | 7% |
| **Pillars extracted** | 53% | 10% | 24% | 8% |
| **Hydro worked** | 73% | 5% | 22% | 11% |

• Seam aggregation logic pre-determines what is defined as mineable coal by applying working section tests based on minimum coal thickness of 50cm, and a maximum raw ash of 30% on an air-dried basis.

• The Escarpment mine utilised truck and shovel for waste and coal movement. The operations are supported by additional equipment including dozers, graders

| Criteria | Commentary |
|---|---|
| | and water carts. |
| | • Moisture Adjustments: Moisture is modified during both the mining and processing operations. In-situ moisture is determined by the process described in Section 3 and is the base point for all moisture adjustments. Recoverable Coal Reserves are stated on a ROM moisture basis, as received by the processing plant. Marketable Coal Reserves are stated on a product moisture basis, as sold. |
| *Metallurgical factors or assumptions* | • The ROM coal produced at Escarpment is not washed resulting in 100% yield for the operation. <br><br> • Product coal specifications include ash, sulphur, moisture and calorific value. |
| *Environmental* | • All environmental approvals are currently in place to operate the mine for the majority of the planned reserve blocks. <br><br> • A small area in the south east is outside current approval boundaries. It is reasonably expected that any modifications to existing agreements or additional agreements that will be required to operate in this area can be obtained in a timely manner. <br><br> • Waste rock characterisation results indicate that a significant proportion of waste rock is potentially acid forming. <br><br> • Waste rock that has been classified as having potentially acid forming potential is actively managed on site with special placement requirements and procedures in the dumps. Costs associated with these practices are included in the site cost model. |
| *Infrastructure* | • All necessary infrastructure is in place and operational for the current proposed operation. |
| *Costs* | • All major infrastructure is in place at Escarpment for the industrial domestic market. <br><br> • All operating costs were based on the 2015 Escarpment actual costs provided by BRL and include allowances for royalties, commissions, mining costs, train loading and administration. <br><br> • Transport charges are based on actual contracted prices. <br><br> • Product specifications were provided by BRL and the logic for penalties for failure to meet specification confirmed. <br><br> • CMC reviewed all costs and they are considered reasonable. |
| *Revenue factors* | • Pricing for the majority of the coal to be sold is at the mine gate. <br><br> • The remaining product coal would be trucked to the east coast of the South Island where it would be blended before sale <br><br> • Product specifications and penalties for failure to meet specifications were provided by BRL. |
| *Market assessment* | • A major customer for this coal ceased operations in June 2016. <br><br> • The search for a replacement market is ongoing however this has not been secured to date. Current markets for this high quality coal are around 35,000 tonnes per annum and feasibility studies have shown that the mine is suboptimal at that market scale <br><br> • The intent of the company is to continue to compete for other markets for this high quality coal and the company is continuing to develop plans for export operations. |
| *Economic* | • The inputs to the economic analysis of the Escarpment mine are derived capital and operating cost estimates outlined in the "Costs" section of this table. The source of the inputs is real and the confidence satisfactory. |

| Criteria | Commentary |
|---|---|
| *Social* | • BRL have key stakeholder agreements in place |
| *Other* | • All mining projects operate in an environment of geological uncertainty. |
| | • Updating of approvals is an ongoing annual process and it is reasonably expected that any modifications to existing agreements or additional agreements that may be required can be obtained in a timely manner. |
| *Classification* | • Classification of Ore Reserves has been derived by considering the Measured and Indicated Resources and the extent of historic underground workings within the pit shells. |
| | • For the Escarpment operation, Indicated Resources and Measured Coal Resources are classified as Proven Coal Reserves, as the Escarpment Domestic reserves will be in sections of historic underground workings where the level of confidence in mineral resources is already adequately reduced by the underground workings. |
| | • The Inferred Coal Resources have been excluded from the Reserve estimates. |
| | • The result reflects the Competent Person's view of the deposit. |
| *Audits or reviews* | • Internal review and reconciliation by BRL of the Reserves estimate has been completed. |
| *Discussion of relative accuracy/ confidence* | • The pit shell is supported by approximately 65% of Measured Coal Resources. The basis of the estimate is the FY16 Escarpment operating costs and two year budget forecasts. Allowance for cost savings achieved on site have not been factored into cost assumptions. |
| | • Analysis of the coal quality has been undertaken by independent laboratories working under international standards of method and accuracy. Escarpment product coal is produced from blended bypass coal products. |
| | • The level of accuracy will continue to be dependent on the ongoing update of the geological model and monitoring of the Modifying Factors affecting the coal estimate. |
| | • Geotechnical studies have been completed for the wider Escarpment project. These studies will be reviewed as the operation develops. |
| | • Internal peer review and reconciliation by BRL and CMC of the Reserves estimate has been completed. |
| | • BRL have an ongoing reconciliation process aimed at testing the appropriateness of the assumed Modifying Factors for the project. |
| | • Accuracy and confidence of modifying factors are generally consistent with the current operation. |

# Appendix

Maps and plans discussed within Table 1 are reported below.



**Figure 2 Location Plan**

**Legend**

□ Bathurst Owned Coal Permits

- Quarternary
- Basement
- Brunner Coal Measures
- Kaiata Formation
- OKeefe Formation
- Pororari Group

**Regional Gelogy**

Geology modified from GNS 'QMap'

**BATHURST** RESOURCES LIMITED

Kilometers
0  0.75  1.5  3  4.5  6
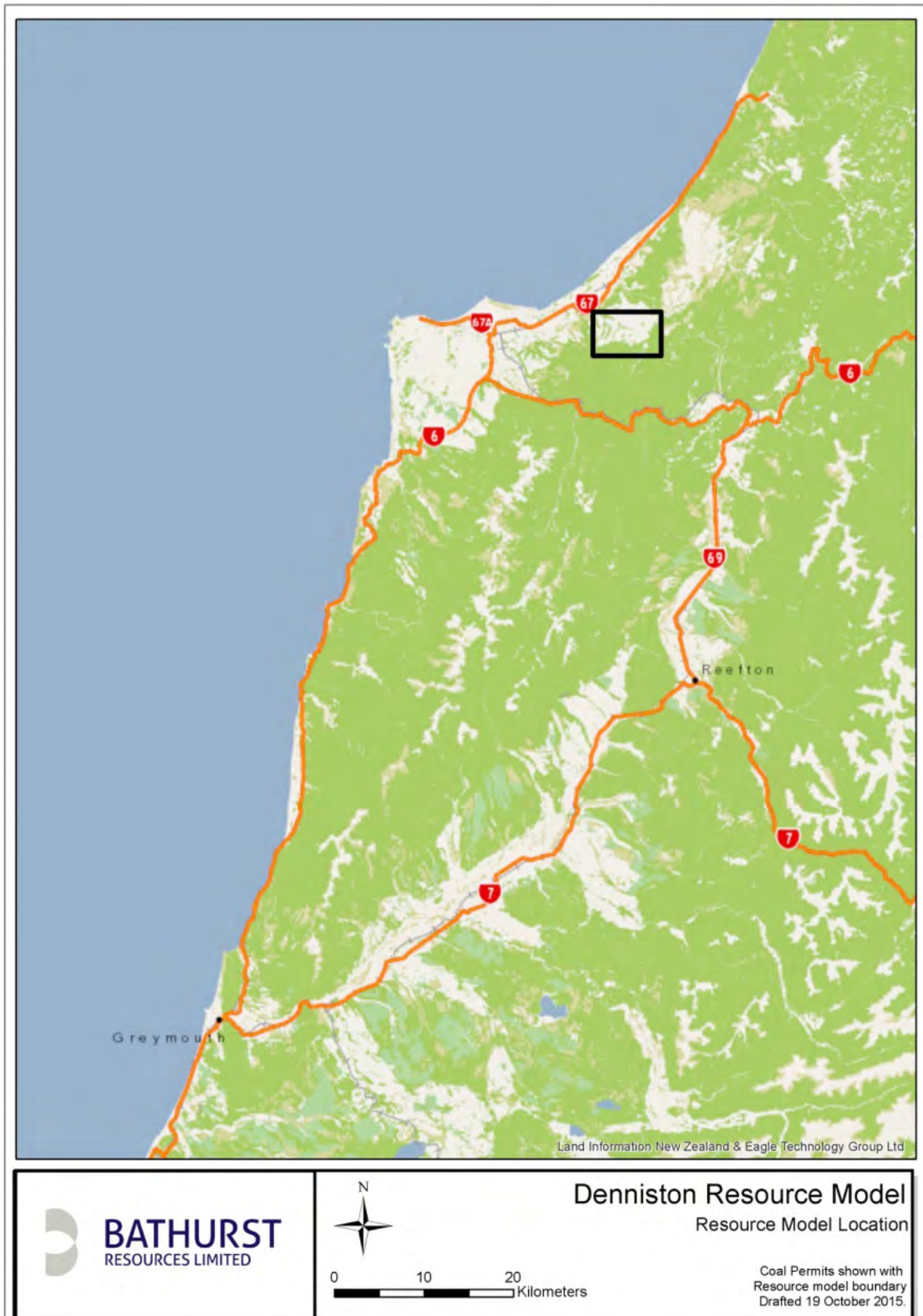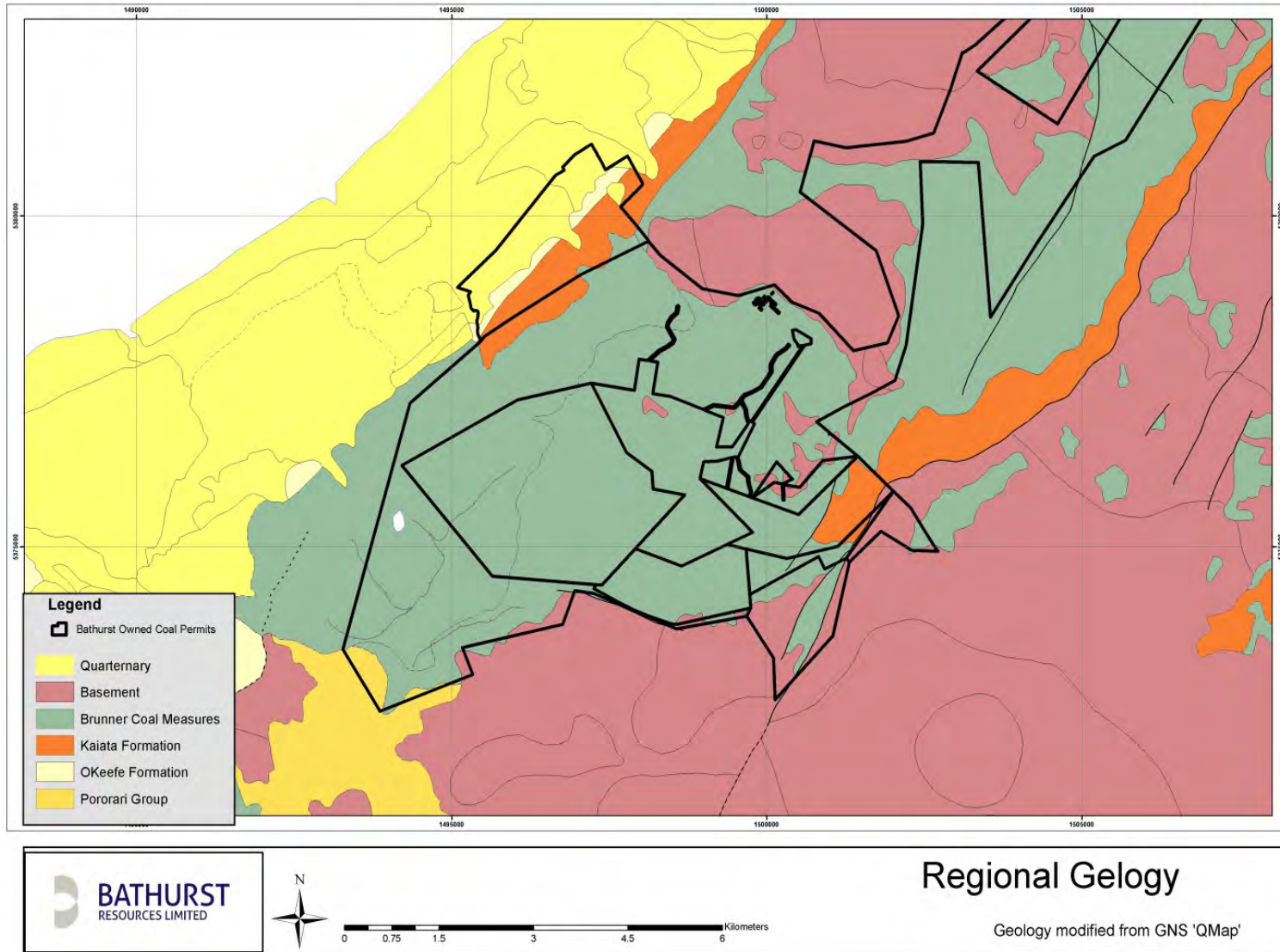
**Figure 3 Regional Geology**
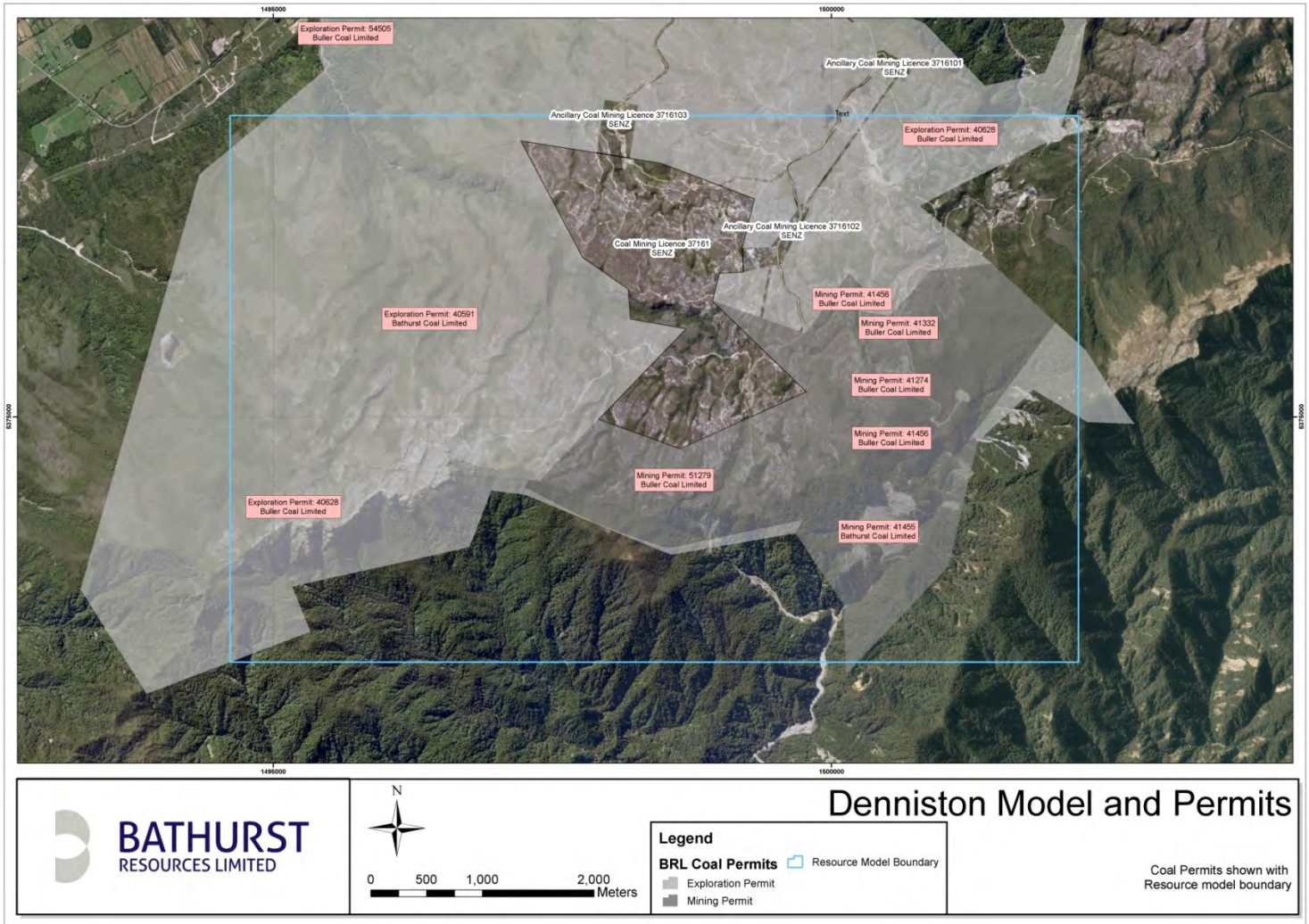
**Figure 4. Denniston Plateau and the coal permits within the resource model area.**
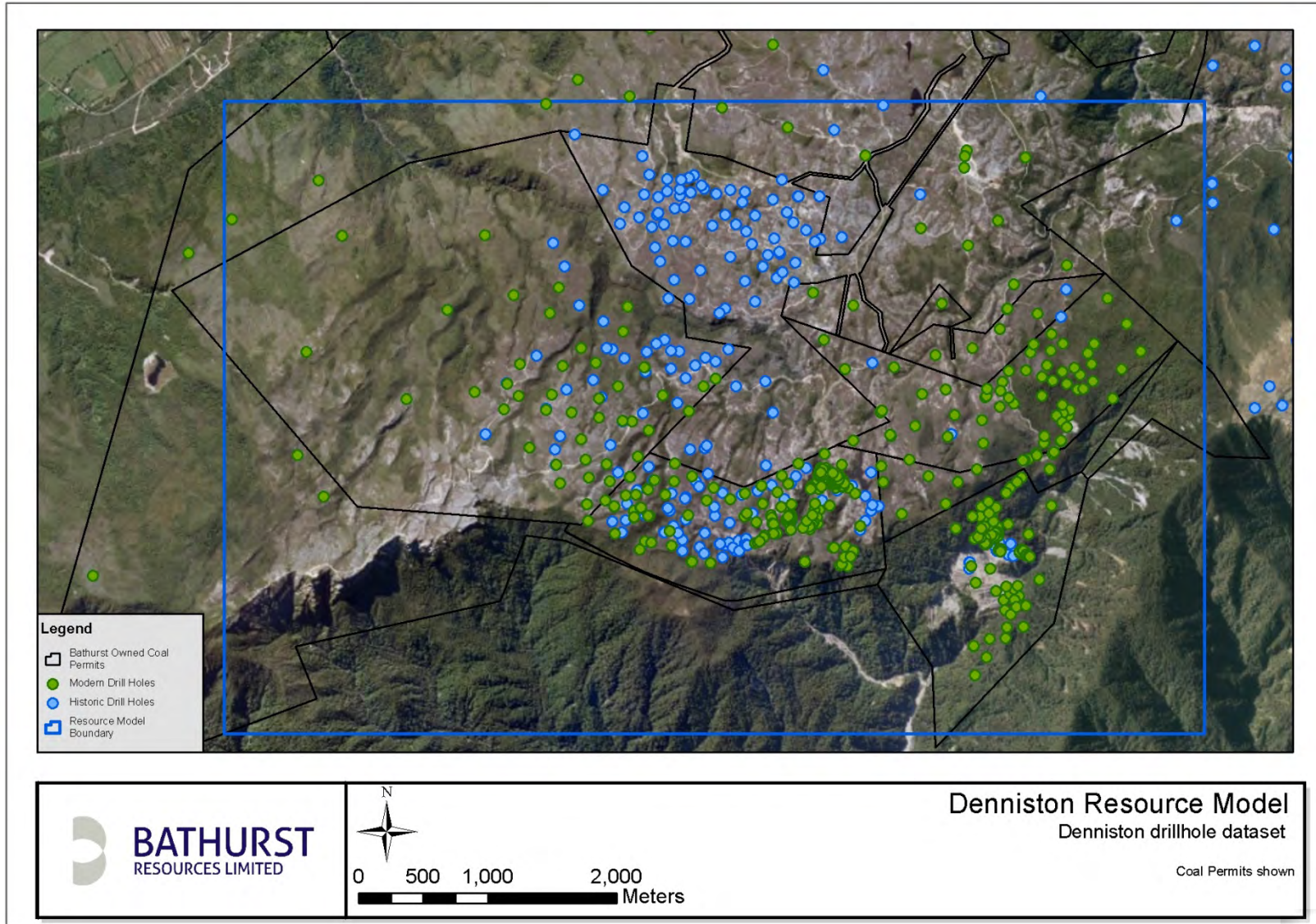
**Figure 5 Plan showing the drilling dataset used to produce the resource model.**
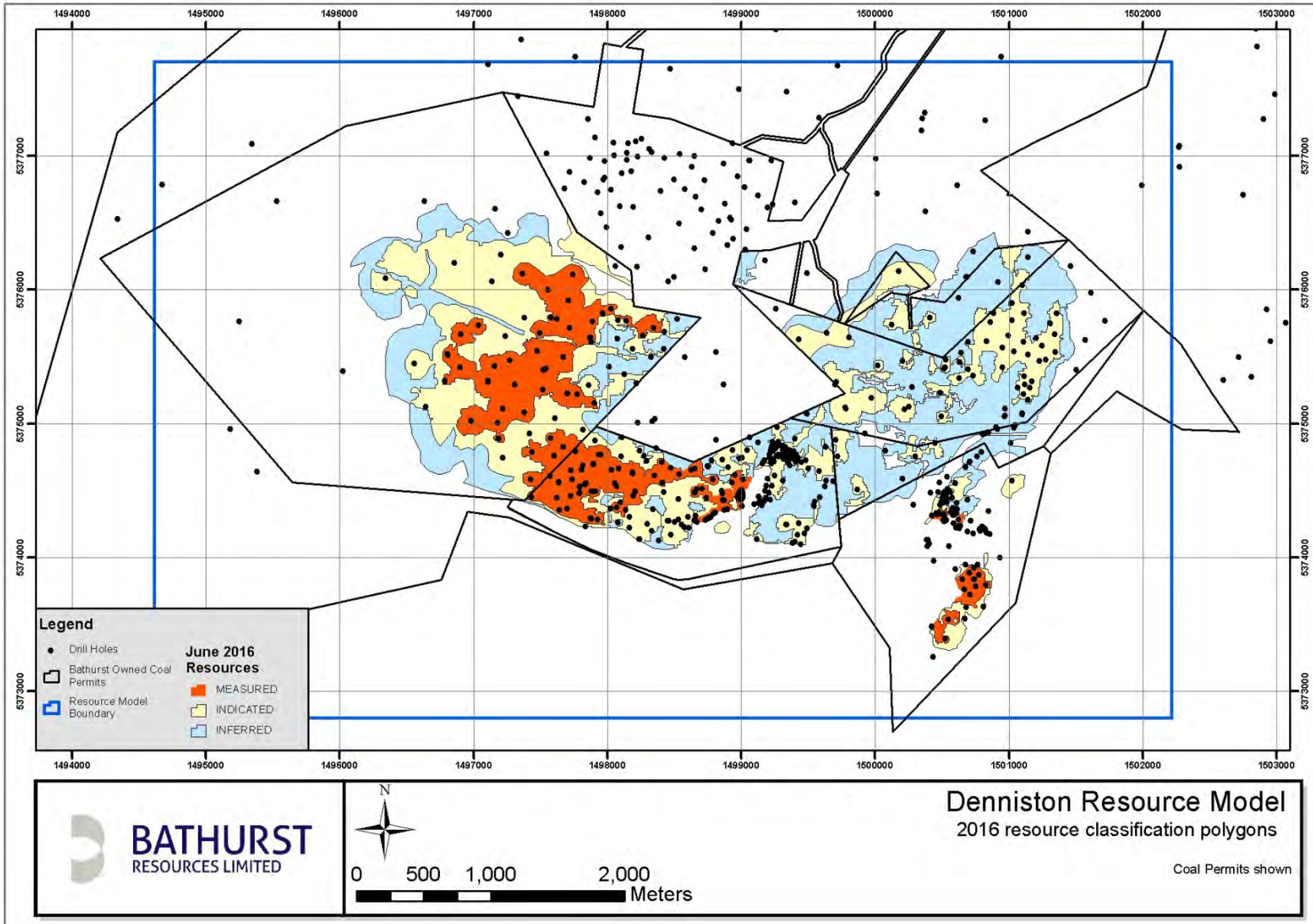
**Figure 6 Plan showing the 2016 resource classification polygons.**
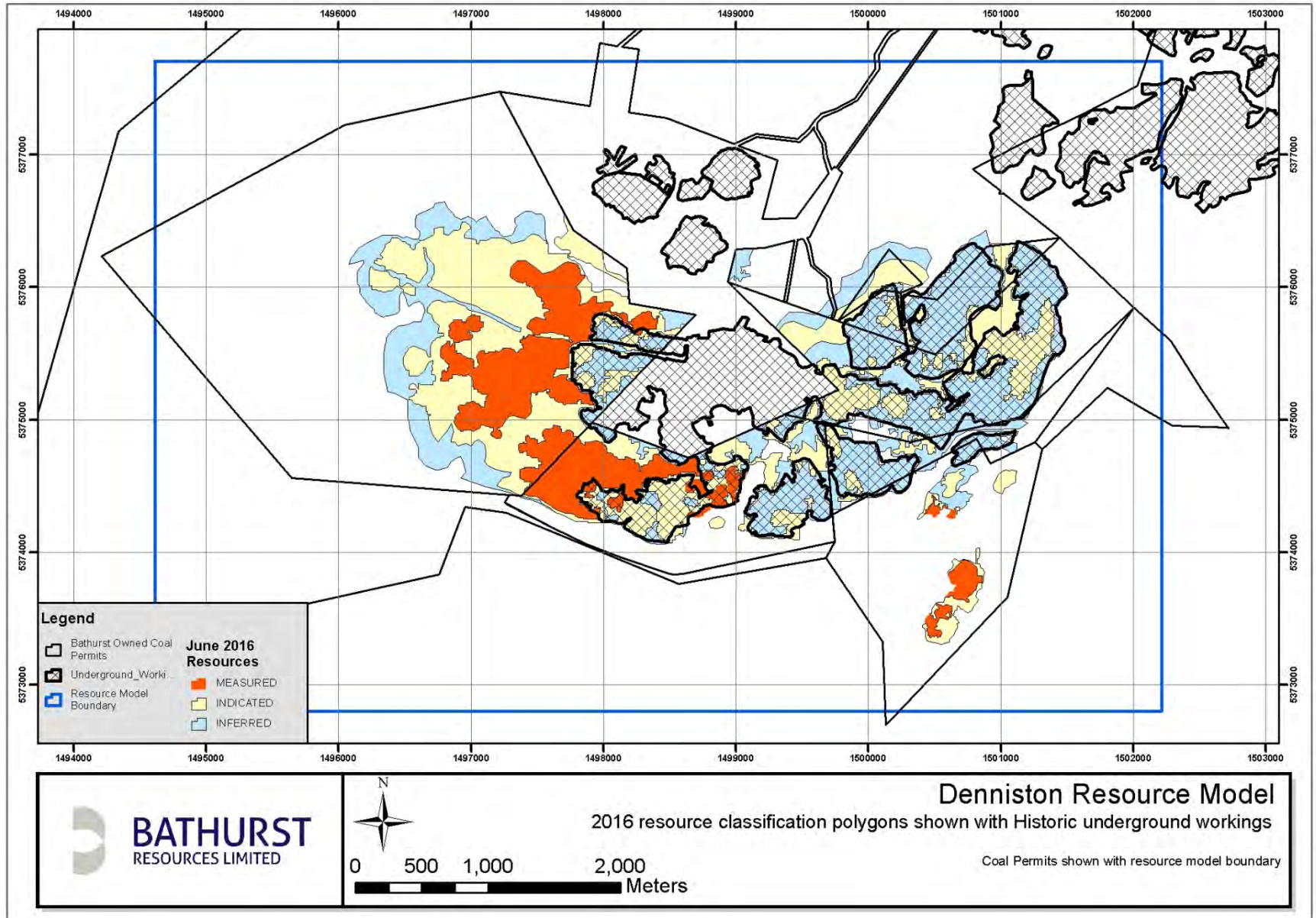
**Figure 7 Extent of Underground Workings and 2016 resource classification**
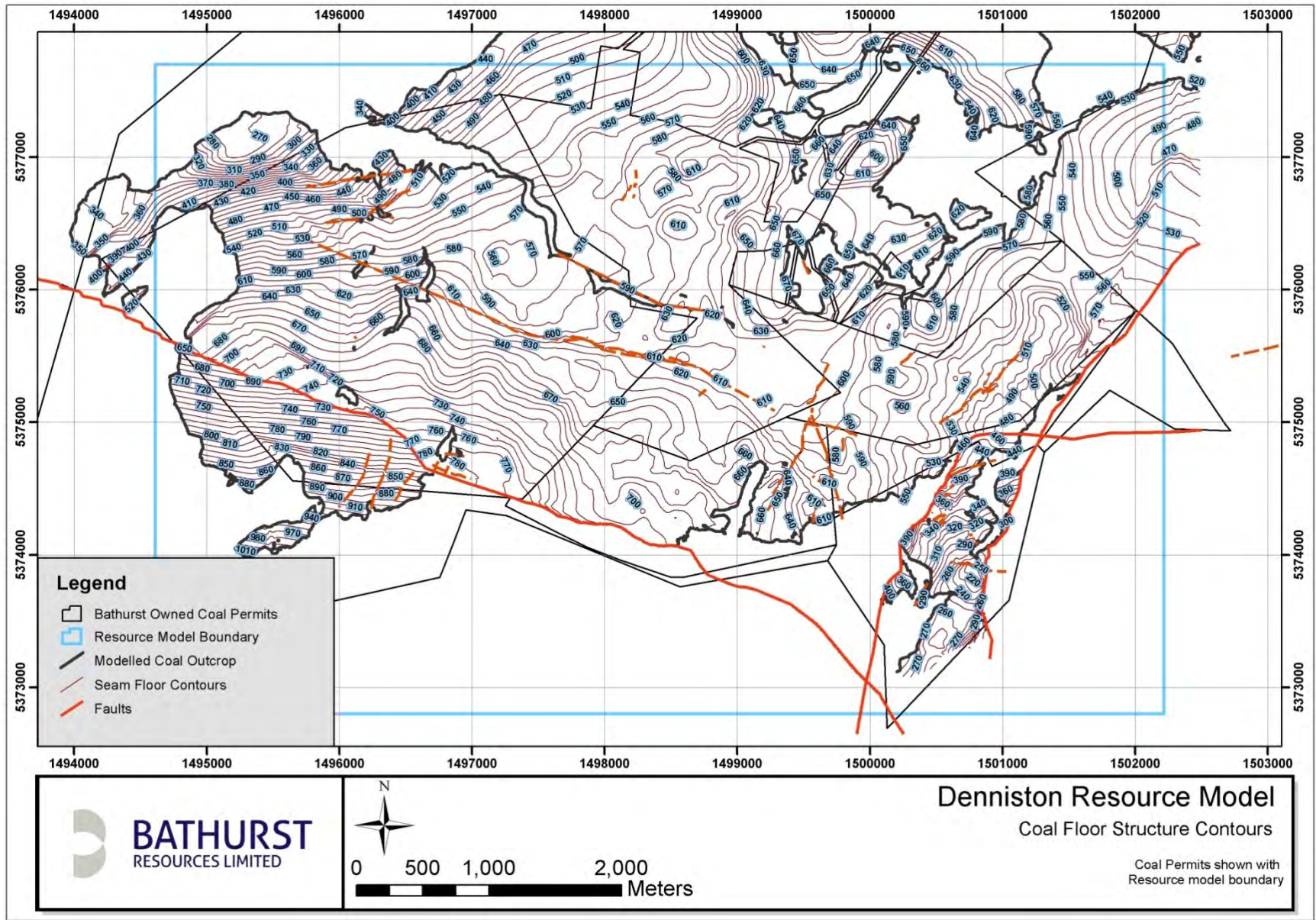
**Figure 8 Plan showing the structure contours of coal seam floor.**
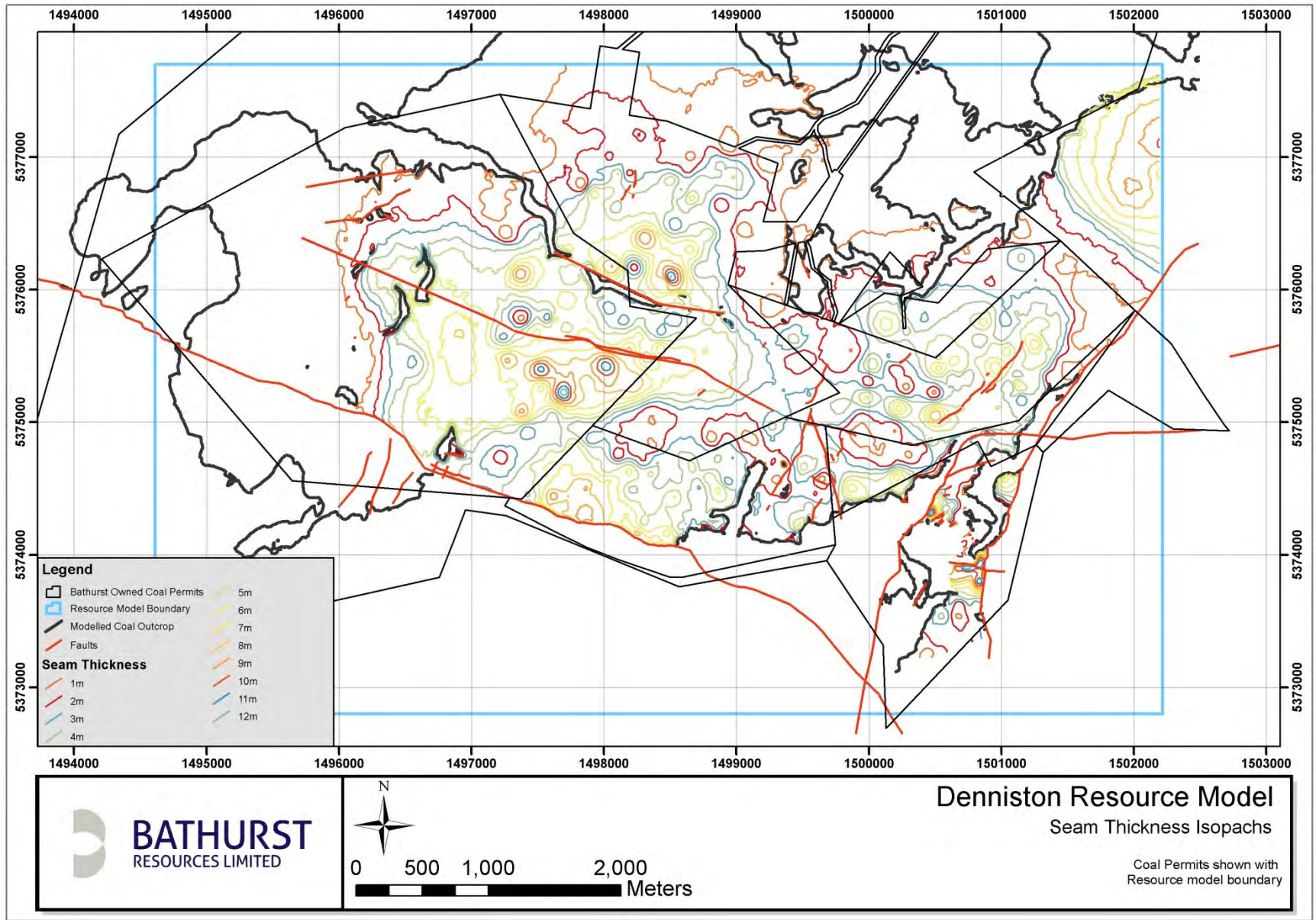
**Figure 9 Plan showing full seam thickness contours over the model area.**
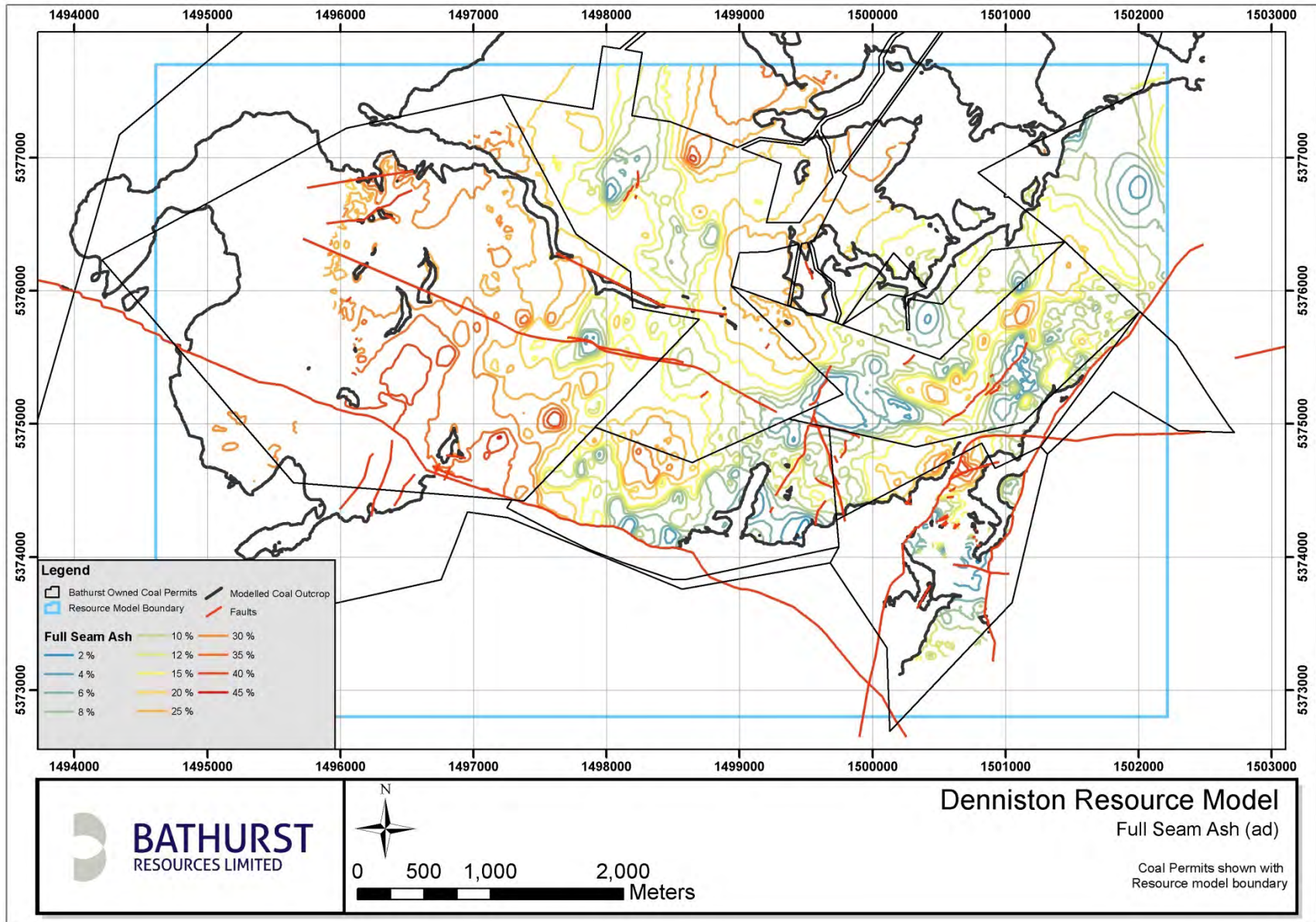
**Figure 10 Plan showing in-situ full seam ash on an air dried basis as modelled over the deposit area.**
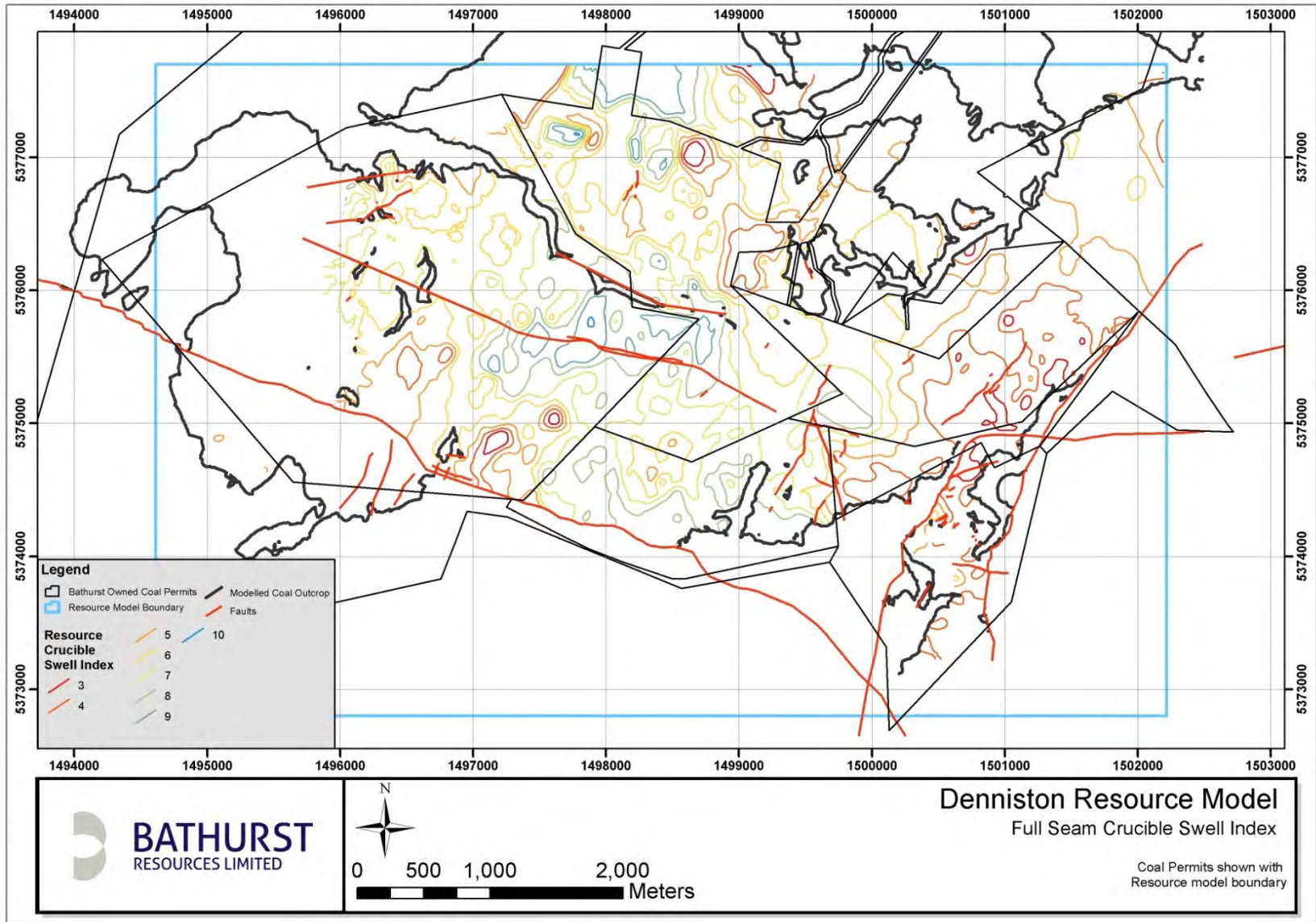
**Figure 11 Plan showing the crucible swelling index (CSN) for coal across the resource.**

**Note that these indicate in-situ values not product CSN after beneficiation due to washing.**

**Legend**

- ☐ Bathurst Owned Coal Permits
- ☐ Resource Model Boundary

**Resource Full Seam Sulphur (ad)**

| | | |
|---|---|---|
| 0.5 % | 2 % | 4.5 % |
| 1 % | 2.5 % | 5 % |
| 1.5 % | 3 % | 5.5 % |
| | 3.5 % | 6 % |
| | 4 % | |

Modelled Coal Outcrop
Faults

**Denniston Resource Model**
Full Seam Sulphur (ad)

Coal Permits shown with
Resource model boundary

0    500   1,000        2,000
Meters
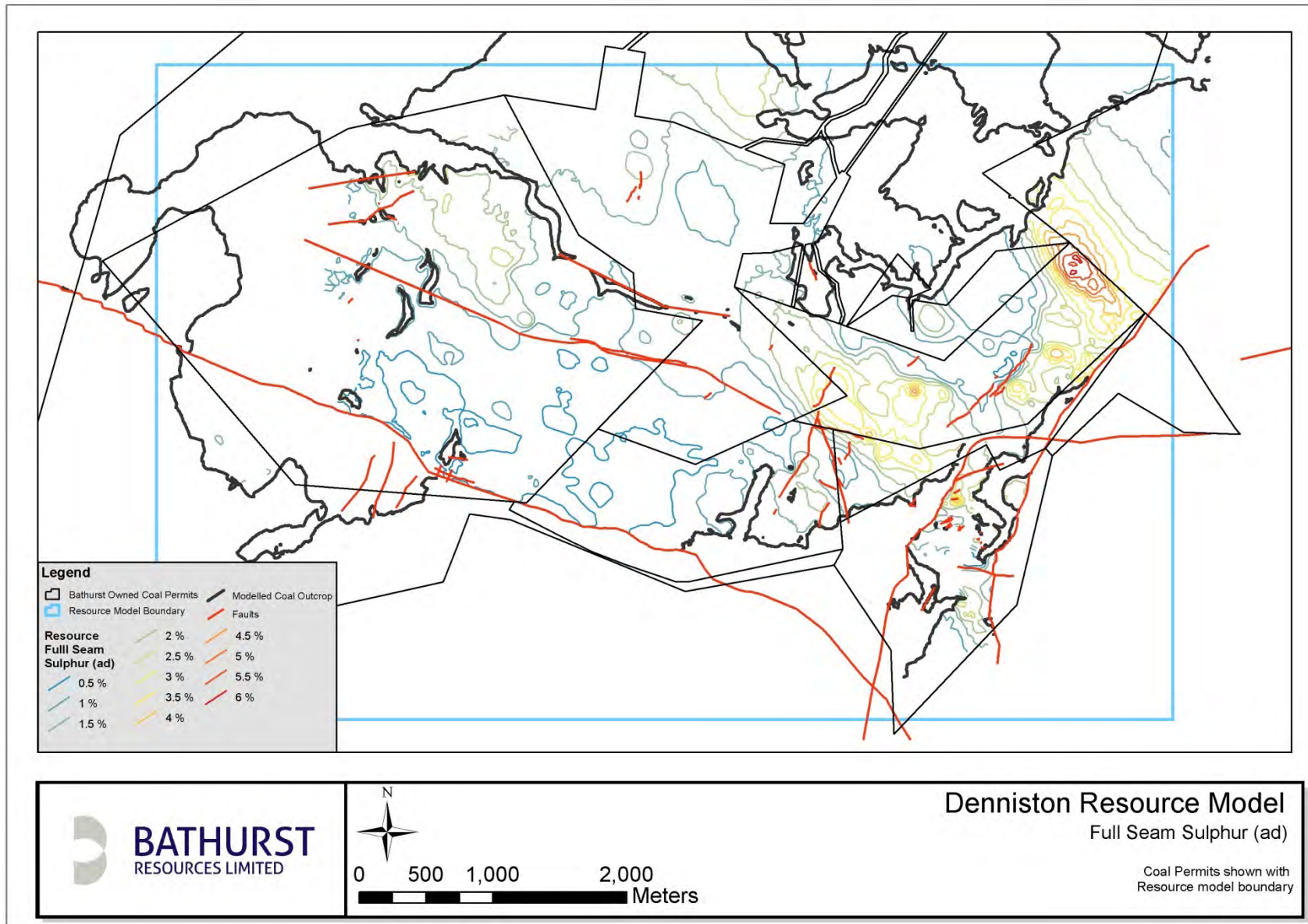
**Figure 12 Plan showing full seam sulphur on an air dried basis across the resource area.**
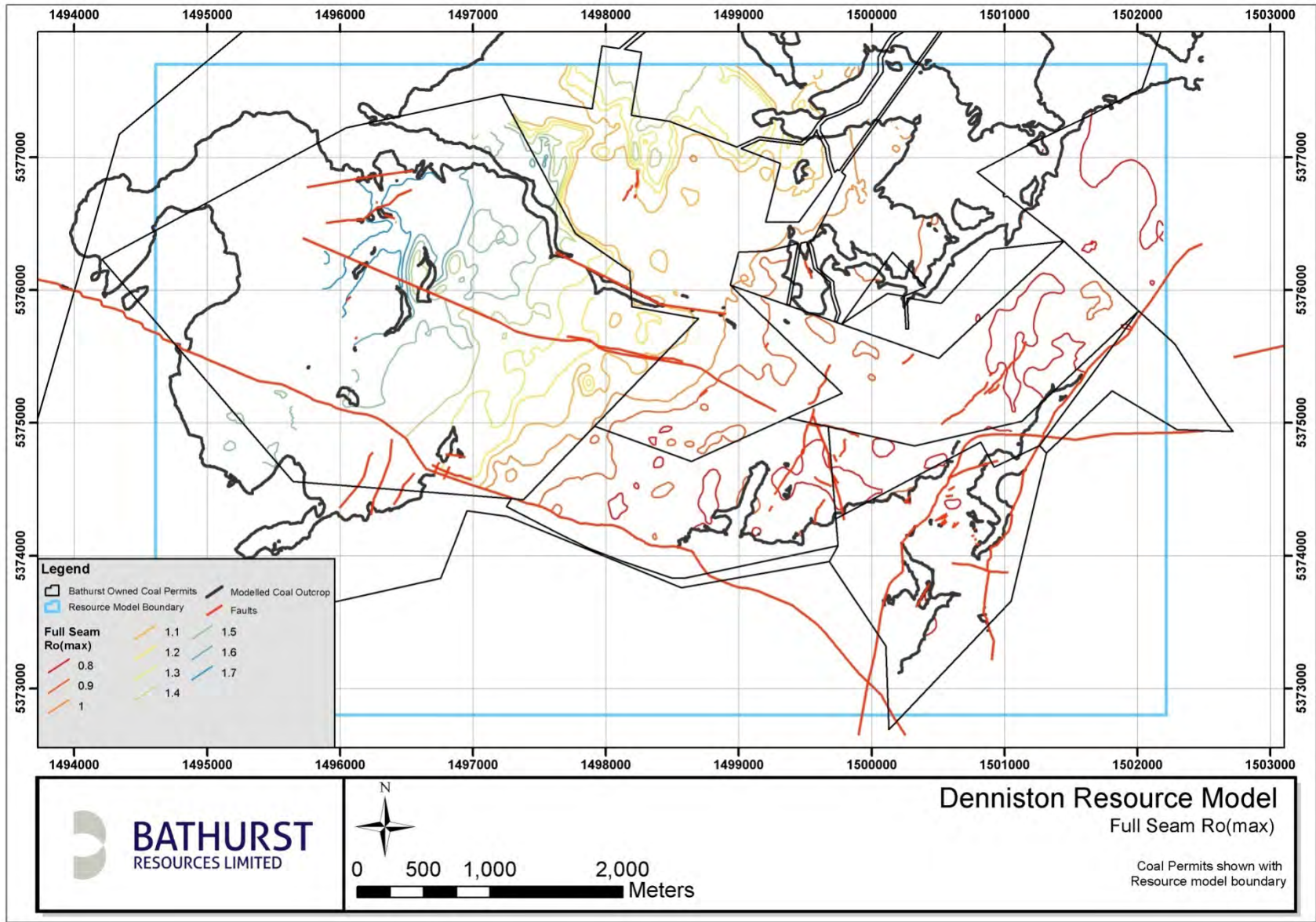
**Figure 13 Plan showing the Ro (max) of coal. This shows the rank trend across the deposit.**
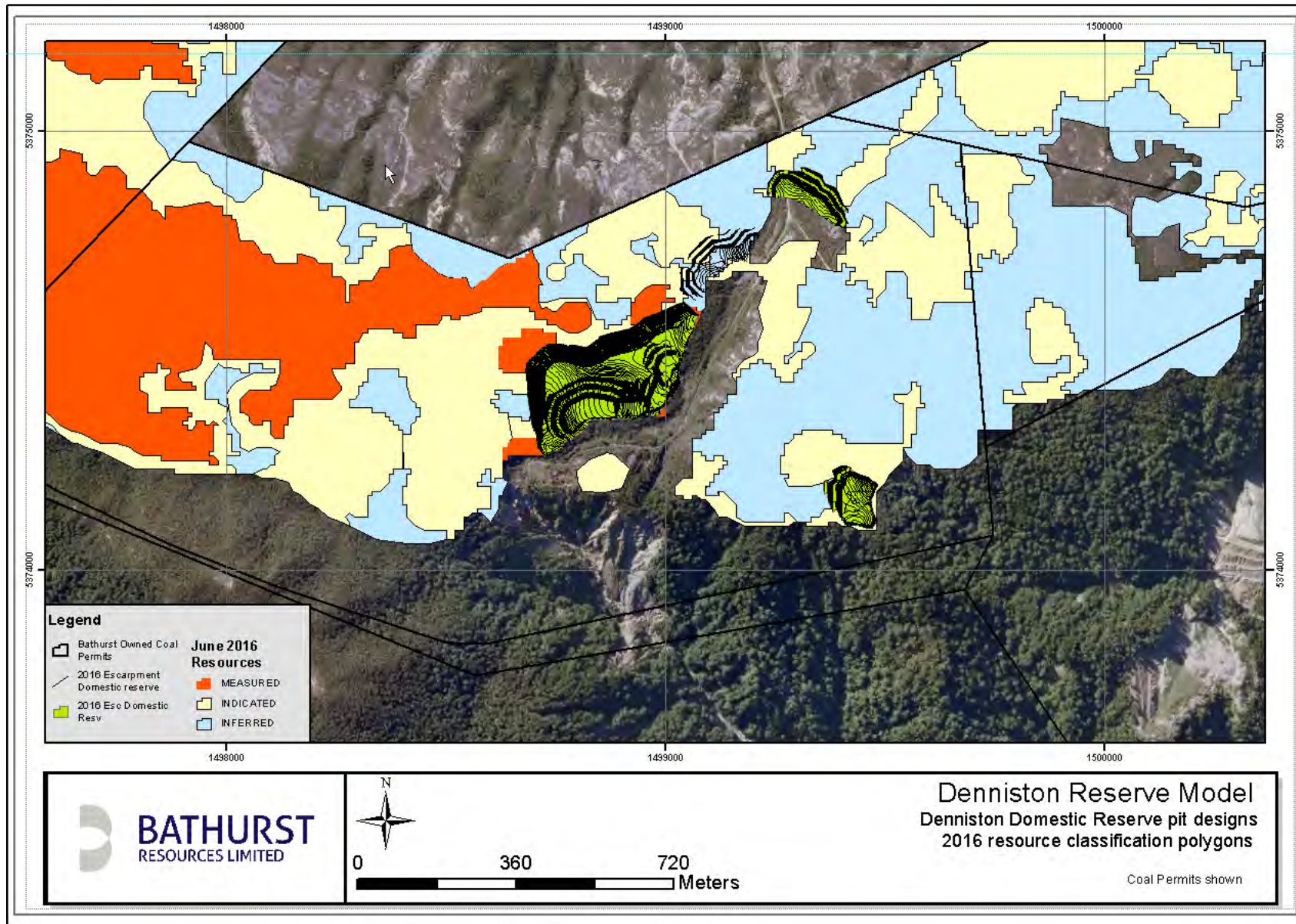
**Figure 14 Escarpment domestic reserves pit shells**

# JORC Code, 2012 Edition – Table 1 report for the North Buller Project

## Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

| Criteria | Commentary |
|---|---|
| *Sampling techniques* | • North Buller is an historic mining district, with recorded coal production spanning over a century. Historic exploration data of varying quality is available for much of the area.<br>• Modern exploration campaigns include data obtained since 2009<br>   o 3 HQ Triple Tube core (TTC) holes drilled by L&M Ltd in 2009<br>   o 96 PQ TTC holes, reduced to HQ where necessary. Drilled from 2012 – 2013.<br>   o 3 outcrop trenches.<br>• Drilling has aimed to infill areas around zones of historic workings that are lacking quality data and to test reliability of historic data. Drilling has been concentrated on a few key areas primarily due to ease of access and prospects for development.<br>• Coal sampling was based on the Bathurst Resources Ltd (BRL) Coal Sampling procedures.<br>• Coal quality ply samples have been selected on all coal logged by a geologist where the geologist had 95% confidence that the ash will fall below 50%. Material with an estimated ash over 50% was not sampled unless the material was a parting of < 0.1m in thickness within a coal seam whereby it would be included within a larger ply sample.<br>• Ply samples were generally taken over intervals no greater than 0.5m.<br>• All analytical data has been assessed and verified before inclusion into the resource model. |
| *Drilling techniques* | • BRL managed drilling campaigns have utilised the following drilling methods<br>   o Full PQ triple tube core (TTC), in many cases overlying strata was open-holed through.<br>   o HQ triple tube core only where necessary<br>   o Washed drilled overburden where applicable<br>• Historic drilling techniques included<br>   o PQ triple tube core<br>   o HQ triple tube core<br>   o NQ triple tube core<br>   o Washed drilled<br>• All exploration drill holes were collared vertically<br>• Recent drilling campaigns utilised PQ sized drilling to maximize core recovery. |
| *Drill sample recovery* | • Core recovery was measured by the logging geologist for each drillers run (usually 1.5m) in each drill hole. If recovery of coal intersections dropped below 85% the drill hole required a redrill. Drillers were paid an incentive if coal recovery was above 90%.<br>• In some instances the recovery of thin rider seams (< 0.5m) has been poor due to the soft friable nature of the coal. Therefore the sample dataset for the rider seams and lower seam is not as evenly spatially distributed as the main seam.<br>• Average total core recovery over the recent drilling campaigns in North Buller was 93%.<br>• Where small intervals of coal were lost, and where geophysics indicated strongly that coal was lost, ash values were estimated using the results of overlying and underlying ply samples and the relative response of the open-hole density trace. |
| *Logging* | • BRL has developed a standardised core logging procedure and all core logging completed by BRL has followed this standard.<br>• All modern drill core has been geologically and geotechnically logged by geologists under the supervision and guidance of a team of experienced exploration geologists.<br>• As much data as possible has been logged and recorded including geotechnical and rock strength data.<br>• All core was photographed prior to sampling. Depth metre marks and ply intervals are noted on core in each photograph.<br>• Down-hole geophysical logs were used to aid core logging.<br>• BRL aimed to geophysically log every drill hole that intersected coal providing that downhole conditions and operational constraints allowed. The standard suite of tools run included density, dip meter, sonic, and natural gamma. |

| Criteria | Commentary |
|---|---|
| | • Where drill hole conditions were poor or mine workings were intersected only in-rods density was acquired. In-rods density produced a reliable trace for use in seam correlation and depth adjustment but was not used for ash correlations.<br>• Down-hole geophysics were used to correlate coal seams, to confirm depths and thickness of coal seams and to validate drillers' logs. Geophysics were also used to accurately calculate recovery rates of coal.<br>• The geophysical logging company maintained and calibrated all tools as per their internal calibration procedures. Additionally, geophysics equipment was calibrated and tested using a calibration hole on the Denniston plateau with known depth to coal, thickness and quality. These calibration methods are deemed to be sufficient as both sites host the same Brunner Coal Measures. |
| *Sub-sampling techniques and sample preparation* | • For all exploration data acquired by BRL, an in-house detailed sampling procedure was used.<br>• Sampling and sample preparation are consistent with international coal sampling methodology.<br>• Ply samples include all coal recovered for the interval of the sample. Core was not cut or halved. Ply sample intervals were generally 0.5m unless dictated by thin, split or parting thickness.<br>• All drilling in the recent campaigns have been completed using triple tube cored holes. No chip or RC samples were taken in these campaigns.<br>• Assay samples were completed at the core repository after transport from drill site in core boxes. Coal intervals were wrapped at the drill site prior to transport.<br>• Samples were taken as soon as practicable and stored in a chiller until transported to the coal quality laboratory.<br>• A series of random duplicate samples representing 4% of the total number of samples from North Buller has been completed by CRL Energy ltd. The results of this duplicate testing were comparable to that reported by SGS New Zealand Limited (SGS).<br>• Geochemical sampling for overburden characterisation has been completed by taking representative samples of core at set 5m intervals above the coal seam in a subset of drill holes. |
| *Quality of assay data and laboratory tests* | • All coal quality testing completed for BRL has been carried out by accredited laboratory SGS.<br>• SGS have used the following standards for their assay test work.<br>  o Proximate Analysis is carried out to the ASTM 7582 standard.<br>  o Ash has also used the standard ISO 1171.<br>  o Volatile matter has also used the standard ISO 562.<br>  o Inherent moisture has also used the ISO 5068.<br>  o Total sulphur analysis is carried out to the ASTM 4239 standard.<br>  o Crucible swell tests are completed using the ISO 501 standard.<br>  o Calorific value results are obtained using the ISO 1928 standard.<br>  o Loss on drying data is completed using the ISO 13909-4 standard.<br>  o Relative Density is calculated using the standard AS 1038.21.1.1.<br>• CRL completed much of the assay test work for samples collected prior to BRL taking over the projects.<br>• CRL used the following standards for their test work<br>  o Inherent Moisture tests utilized the ISO 117221 standard<br>  o Ash tests utilised the ISO 1171 standard<br>  o Volatile matter tests utilized the ISO 562 standard<br>  o Calorific value tests utilized the ISO 1928 standard<br>  o Crucible swelling index testing was carried out using the ISO 501 standard<br>• Both SGS and CRL are accredited laboratories.<br>• All analysis was undertaken and reported on an air dried basis unless stated otherwise.<br>• BRL has completed a total of 11 composite coal quality samples. Composite samples have been tested using the following standards: |

| Test Work | Standard Followed |
|---|---|
| **Loss on air drying** | (ISO 13909-4) |
| **Inherent Moisture** | (ASTM D 7582 mod) |

| Criteria | Commentary | |
|---|---|---|
| | Ash | (ASTM D 7582 mod) |
| | Volatile Matter | (ASTM D 7582 mod) |
| | Fixed Carbon | by difference |
| | Sulphur | (ASTM D 4239) |
| | Swelling Index | (ISO 501) |
| | Calorific Value | (ISO 1928) |
| | Mean Maximum Reflectance All Vitrinite (RoMax) | Laboratory Standard |
| | Chlorine in Coal | (ASTM D4208) |
| | Hardgrove Grindability Index | (ISO 5074) |
| | GIESELER PLASTOMETER | (ASTM D 2639) |
| | AUDIBERT ARNU DILATOMETER | (ISO 349) |
| | FORMS OF SULPHUR | (AS 1038 Part 11) |
| | ASH FUSION TEMPERATURES | (ISO 540) |
| | ASH CONSTITUENTS (XRF) | (ASTM D 4326) |
| | Ultimate Analysis | Laboratory Standard |

| | |
|---|---|
| *Verification of sampling and assaying* | <ul><li>Sample assay results have been cross referenced and compared against lithology logs and downhole geophysics data. Results are also inspected by experienced geologists and compared with expected values utilising known coal quality relationships for the North Buller coalfield.</li><li>Anomalous assay results were investigated, and where necessary the laboratory was contacted and a retest undertaken from sample residue.</li><li>Three twinned holes have been drilled at the project with consistent results obtained between drill holes.</li><li>Laboratory data is imported directly into an Acquire database with no manual data entry at either the SGS laboratory or at BRL.</li><li>Assay results files are securely stored on a backup server, once validated, drill hole information is 'locked' in an Acquire database to ensure the data is not inadvertently compromised.</li></ul> |
| *Location of data points* | <ul><li>Modern drill hole positions have been surveyed using Trimble RTK survey equipment.</li><li>Historic mine plans have been georeferenced by locating and surveying historic survey marks, and mine portals drawn on mine plans. Some historic mine plans are poorly controlled spatially and a large variance from the current georeferenced images is possible.</li><li>New Zealand Trans Mercator 2000 Projection is used by BRL for most of its project areas. NZTM is considered a standard coordinate system for general mapping within New Zealand. Historic data has been converted from various local circuits and map grids using NZ standard cadastral conversions.</li><li>A LiDAR survey was carried out over the North Buller area in December 2012. This LiDAR data provides very accurate topographic data used in the model. Contractor's specifications state that, for the choice of sensor and operating settings used for this project, the LiDAR sensor manufacturer's specification states 0.15m (1-sigma) horizontal accuracy and 0.1m (1-sigma) as the open ground elevation accuracy.</li><li>Surveyed elevations of drill hole collars are validated against the LiDAR topography and ortho-corrected aerial photography. Historic hole collar elevations have been compared to the LiDAR surface and while most are within 1m to 2m of the surface. There are however a small number of historic holes with a large discrepancy in the RL of the collar and the LiDAR surface. This discrepancy may be due in part to earthworks.</li></ul> |
| *Data spacing and distribution* | <ul><li>Drill hole spacing in North Buller is not homogenous. Recent drilling has targeted areas surrounding historic underground workings and where land access has been available. This has produced three areas of relatively high density drilling, namely Charming Creek, Chasm Creek Central and Coal Creek blocks.</li><li>Data spacing for the three drilling areas has been estimated by calculating the radius required to fill the total area of each project divided by number of drill holes within that area. Average drill hole spacing for these areas is summarised below.<ul><li>Charming Creek has an estimated average spacing of 125m.</li></ul></li></ul> |

| Criteria | Commentary |
|---|---|
| | <ul><li>○ Chasm Creek central has an estimated average spacing of 100m.</li><li>○ Coal Creek area has an estimated average drill hole spacing of 125m.</li><li>Average drill hole spacing for the entire project area is approximately 210m.</li><li>Drill hole spacing is not the only measurement used by BRL to establish the degree of resource uncertainty and therefore the resource classification. BRL uses a multivariate approach to resource classification.</li><li>The current drill hole spacing is deemed sufficient for coal seam correlation and resource estimation purposes within targeted areas.</li><li>Geostatistics has been applied to the North Buller dataset but variography results were poor due to the uneven distribution of drill holes and structural complexity of parts of the deposit. Full seam variography of ash indicated a maximum distance correlation of ~500m and therefore no resources have been classified where distance to nearest samples are greater than 500m.</li><li>The samples database is composited to 0.5m sample length prior to grade estimation. Any samples with composited length of less than 0.1m are not included in the estimation. Compositing starts at the top of seam and small samples are not distributed or merged.</li></ul> |
| *Orientation of data in relation to geological structure* | <ul><li>All exploration drilling has been completed with a vertical orientation. Down hole deviation data was acquired by BRL during modern campaigns and showed little to no deviation in those holes. Holes without deviation plots are assumed to be vertical.</li><li>Any deviation from vertical is not expected to have a material effect on geological understanding as the average drill hole depth in the dataset is 45m with the deepest coal intersection of 116m. At a depth of 60m a 1° deviation would produce a horizontal deviation of 1m at the end of hole and a negligible thickness deviation.</li><li>The majority of the deposit presents a shallow seam dip between 5° – 10°.</li><li>Vertical drilling is considered to be the most suitable drilling method of assessing the coal resource at North Buller.</li></ul> |
| *Sample security* | <ul><li>Stringent sample preparation and handling procedures have been followed by BRL. Ply samples are taken and recorded from drill core, bagged and placed within a locked chiller prior to being dispatched for analysis.</li><li>It is not considered likely that individual coal samples face a risk of theft or sabotage as coal is a bulk commodity with little value for small volumes of coal from drill core.</li></ul> |
| *Audits or reviews* | <ul><li>BRL has reviewed the geological data available and considers the data used to produce the resource model is reliable and suitable for the purposes of generating a resource estimate.</li><li>Results of a duplicate sample testing programme comparing SGS and CRL showed a strong correlation between labs.</li><li>Senior BRL geologists undertake audits of the sample collection and analysis.</li></ul> |

## Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

| Criteria | Commentary |
|---|---|
| *Mineral tenement and land tenure status* | <ul><li>BRL owns and operates two coal exploration permits in the North Buller area, northwest of Westport, New Zealand.</li><li>BRL has 100% ownership in the following coal permits:</li></ul><br><table><tr><th>Permit</th><th>Operation</th><th>Expiry</th></tr><tr><td>Mining Permit 56233</td><td>Coal Creek</td><td>22/03/2031</td></tr><tr><td>Exploration Permit 40628</td><td>Buller</td><td>10/01/2015</td></tr></table><br><ul><li>BRL has been granted Mining Permit to replace EP51078 and it is reasonably expected that this permit application will be granted</li><li>An appraisal extension application has been submitted to NZP&M for EP40628 and the application is currently being processed.</li><li>The acquisition of the EP40628 and EP51078 permits (and any subsequent permits over the same area) from L&M includes a life of mine royalty based on a fixed percentage of</li></ul> |

| Criteria | Commentary |
|---|---|

- FOB revenue.
- The majority of the land in the North Buller area is Crown land administered by the Department of Conservation (DoC) as Ecological Areas (Section 21 Conservation act 1987) and Stewardship Areas (Part V Section 25 Conservation Act 1987). These areas are managed to protect the natural and historic values of the areas. Stewardship areas can be disposed of, but disposal is subject to a public process and it must be clear that their retention and continued management would not materially enhance the conservation or recreational values of adjacent land.
- Another large landowner within the study area is Ngai Tahu. BRL currently has an agreement with Ngai Tahu to provide access to land for exploration purposes and it is reasonably expected that access for mining would be able to be negotiated.

*Exploration done by other parties*

- Historic geological investigations and reports for the North Buller area have been compiled spanning the past 120 years.
- The historic drilling database includes the following drill holes compiled from historical data records.

| Years | Agency | Range of Collar ID | # Holes | Drilling Method | # Holes in structure model | # holes in quality model | Geophysics Available |
|---|---|---|---|---|---|---|---|
| 1907 | NZ State Coal - Seddonville Colliery | 431 - 436 | 6 | unknown | 4 | 0 | 0 |
| 1910 - 1912 | Mines Department | 415 - 430 | 16 | unknown | 16 | 0 | 0 |
| circa 1918 | Harbour Board | 403, 437, 438 | 3 | unknown | 3 | 0 | 0 |
| 1896 - 1936 | Westport - Cardiff Coal Co. | * | 7 | unknown | 7 | 0 | 0 |
| 1931-1932 | Cardiff Bridge Co-op Party | * | 3 | Diamond Core | 1 | 0 | 0 |
| unknown | unknown | 401 - 402 | 2 | unknown | 1 | 0 | 0 |
| Pre 1953 | Charming Creek Mine | 439 - 450 | 12 | unknown | 11 | 0 | 0 |
| Pre 1968 | Charming Creek Mine | 451 - 462 | 12 | unknown | 10 | 0 | 0 |
| unknown | Cardiff or Coronation Coal | 463 - 469 | 7 | unknown | 6 | 0 | 0 |
| unknown | Cardiff Holdings | 470 - 474 | 5 | unknown | 1 | 0 | 0 |
| circa 1964 | Coal Creek Mine | 475 - 481 | 7 | unknown | 4 | 0 | 0 |
| Unknown | unknown | 491 - 493 | 3 | unknown | 3 | 0 | 0 |
| Pre 1952 | unknown | 404 - 413 | 10 | unknown | 7 | 0 | 0 |
| Pre 1952 | shaft | 414 | 1 | unknown | 1 | 0 | 0 |
| 1986 | Ministry of Energy | 1432, 1442 - 1445 | 5 | HQ core | 5 | 4 | 5 |
| 1978 | MWD | 482 - 490 | 10 | Diamond Core | 9 | 0 | 0 |

- All historic data has been validated against original source documents by L&M, Golder Associates (NZ) Ltd and again by BRL staff post acquisition of the project. Where data was deemed unreliable it was removed from the relevant resource model dataset.
- BRL is continuing to source further historic plans and reports from a number of data libraries around New Zealand.

*Geology*

- The North Buller project is located in the Buller Coal field, New Zealand.
- The Buller Coalfield is at the northern end of the Paparoa Trough, a north northeast trending half-graben that subsided in the Eocene and was subsequently uplifted in the Cenozoic.
- The defined resource is contained within the Eocene aged Brunner Coal Measures. The coal measures consist of a fluviatile sequence of fine to very coarse sandstones, siltstone, mudstone and coal seams. The deposit generally contains a single seam deposited in elongate pods with some localised splitting of the seam and, in some areas, a pronounced rider seam package. The coal thickness can be up to 11m but generally averages 3-4m in thickness.
- The coal measures thin towards the east and thicken to the west where a thick conglomerate forms the base of the formation.
- Overlying the coal measures in most areas is the Kaiata Formation which consists of marine, slightly carbonaceous and calcareous mudstones.
- Quaternary river gravel deposits are scattered throughout the project area.
- Overburden thickness is generally around 30-40m but depths range from zero at the outcrop to over 300m in the northern extent of the model.

| Criteria | Commentary |
|---|---|
| *Drill hole Information* | • Individual drill hole results are not tabulated and presented in this report however all drill hole data that pertains to the target coal seams has been loaded and modelled in the geological computer model used to estimate coal resources. <br> • The exclusion of this information from this report is considered to not be material to the understanding of the deposit. <br> • Incorporation of deviation data is not considered necessary, due to the gentle dips found in the area and shallow drilling methods resulting in insignificant deviation recorded in the exploration boreholes. |
| *Data aggregation methods* | • The maximum ash cut-off for building the North Buller structure model was set at 50% however, due to various reasons, some thin assay samples where ash is greater than 50% are included in the coal quality dataset due to the structure model including the interval within a coal seam. <br> • Resources have been reported with an ash cut-off of 25%. <br> • Seams have been sampled on a ply-by-ply basis with ply boundaries determined by reconciliation against down hole geophysics. |
| *Relationship between mineralisation widths and intercept lengths* | • All exploration drill holes have been drilled vertically and the coal seams are generally gently dipping. Therefore the reported seam intercept thickness is representative of the true seam thickness. <br> • Dip meter and deviation plots are available for some holes. For those without this data it is assumed that a vertical orientation is achieved and, as most coal intersections are less than 100m in depth, any deviation from vertical would produce only a very minor effect on the reported depth to coal and coal thickness. |
| *Diagrams* | • Plans have been attached in the appendix. |
| *Balanced reporting* | • Exploration drilling results have not been reported. This has avoided any issues with unbalanced or biased reporting. <br> • The Competent Person does not believe that the exclusion of this comprehensive exploration data within this report detracts from the understanding of this report or the level of information provided. |
| *Other substantive exploration data* | • Geotechnical logs and samples were taken by the geologist during all exploration by BRL. Geotechnical logs identified defect types, angles and character through cored intervals. <br> • BRL has tested 45 samples for overburden classification for acid forming and neutralising potential in North Buller. These tests indicate that the majority of overburden is acid neutralising. <br> • Further overburden characterisation testing will be conducted prior to any mining proposal. |
| *Further work* | • BRL has been granted an access arrangement from the Department of Conservation (DoC) for drilling activities on land administered by DoC in the North Buller project area. BRL is currently focusing resources on its Escarpment project and therefore no drilling is planned for North Buller in the near future. <br> • Field mapping is continuing in North Buller to confirm future drilling targets outside of the current resource areas. <br> • A bulk sample is planned to be taken from within the North Buller project area for marketing purposes. |

## Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

| Criteria | Commentary |
|---|---|
| *Database integrity* | • All historic and legacy datasets have been thoroughly validated against original logs and results tables. <br> • BRL utilises an Acquire database to store and maintain its geological exploration dataset. <br> • The Acquire database places explicit controls on certain data fields as they are entered or imported into the database such as overlapping intervals, coincident samples, illegal sample values, standardised look-up tables for logging codes etc. |

| Criteria | Commentary |
|---|---|
| | • Manual data entry of assay results is not required as results are imported directly. |
| *Site visits* | • Hamish McLauchlan (the Competent Person) has worked as a senior geologist for over 10 years in the Buller coal field.<br>• Hamish is familiar with the local and regional geology and style of deposit within the North Buller region. |
| *Geological interpretation* | • BRL has confidence in the geological model and the interpretation of the available data. Confidence varies for different areas and this is reflected by the resource classification.<br>• BRL uses a multivariate approach to resource classification which takes into account a number of variables.<br>• BRL considers the amount of geological data sufficient to estimate the resource.<br>• Uncertainty surrounds the historic mine workings, both in the quality and quantity of coal extracted and surveying and positioning of underground workings. This is reflected in the resource classification<br>• BRL has used a total of 10 synthetic holes in the structure model which are based on historic drill holes where georeferencing of the collar locations is poor.<br>• Quaternary river gravel deposits overly the coal measures as an unconformity over the northern portion of the project area. Some uncertainty surrounds the depth of weathering and the extent of the gravel deposits. A conservative approach to modeling this Quaternary erosional surface has been used in the model. |
| *Dimensions* | • The main coal seam varies in thickness from less than 1m thick up to 11m thickness locally.<br>• Depth of cover varies from 0m at outcrop to over 300m at the northern boundary of the model.<br>    ○ Inferred resources include coal to 118m below surface;<br>    ○ Indicated resources include coal to 102m below surface;<br>    ○ Measured resource includes coal down to 64m below surface.<br>• The deposit roughly covers a 6km by 5km area. The deposit is bounded by the Mokihinui River to the north, and the Glasgow Fault to the east and the Lamplough Fault to the West. |
| *Estimation and modeling techniques* | • All available and reliable exploration data has been used to create a geological block model which has been used for resource estimation and classification.<br>• All exploration drilling data is stored in Acquire and exported into a Vulcan drill hole database. All Mapping data is stored in Acquire and exported in various Vulcan layers. Interpretive data is stored within Vulcan in various layers.<br>• A coal horizons definition has been developed and is used in the stratigraphic modeling process.<br>• Vulcan 8.2.1 was used to build the structure model. Grid spacing is 10m x 10m. This spacing was selected to be 1/5 of the minimum drill spacing of a targeted area.<br>• Vulcan's stacking method was used to produce the structure model. This method triangulates a reference surface (coal roof) and then stacks the remaining horizons by adding structure thickness using inverse distance.<br>• The maximum triangle length for the reference surface was set to 2,000m.<br>• Based on geostatistics for full seam thickness, the maximum search radius for inverse distance is 2,000m. The inverse distance power is set to 2, with maximum samples set to 8.<br>• Structure grids are checked and validated before being used to construct the resource block model.<br>• Vulcan 8.2.1 is used to build the block model and to grade estimate. The process is automated using a Lava script.<br>• The coal structure surfaces, along with LiDAR topography surfaces and quaternary unconformity surfaces are used to build the block model. The block dimensions are constructed at 10m x 10m. Vertical thickness for coal blocks is 0.5m, whilst overburden blocks are set to 5m maximum thickness.<br>• Grade estimation is performed utilising Vulcan's Tetra Projection Model. The main seam, and two discontinuous rider seams are estimated for ash, sulphur, air dried moisture and in-situ moisture, volatile matter, crucible swell index, and calorific value. All qualities are estimated simultaneously. A total of 10 search passes are used to grade estimate the |

| Criteria | Commentary |
|---|---|
| | model. |
| | • Geostatistics has been performed on the coal quality dataset to examine and define the estimation search parameters for each quality. The maximum search radius is set to the maximum range of influence found in the semi-variogram for each variable. |
| | • Grade estimation is computed using an inverse distance squared function. |
| | • Various methods have been used to check the validity of the block estimation. This includes manual inspection of the model, QQ plots of block model qualities versus the coal quality database and other comparison tools. |
| | • Resource tonnages within the model have been discounted where the resource falls within an historic underground workings area. The primary mining method utilised historically in North Buller area is Bord and Pillar mining, however the Charming Creek mine and other mines used a hydro extraction method beginning in the mid-1950s. Three different classifications have been attributed to the historic workings, with each classification having a different extraction rate. Historic extraction rates are estimated using mining extraction reports and tonnage reports. The extraction rates used to discount coal tonnages in the resource model are as follows: |

| Mining Method | Extraction Rate |
|---|---|
| First worked | 35% |
| Pillars extracted | 53% |
| Undifferentiated | 50% |

| Criteria | Commentary |
|---|---|
| Moisture | • Resource tonnages are reported using natural bed moisture, calculated from air dried density, air dried moisture and in-situ moisture using the Preston Sanders equation.<br>• Block air dried density is calculated from the block air dried ash value using the ash-density relationship derived from the project dataset. |
| Cut-off parameters | • Structure grids have been developed based on a 50% ash cutoff. Some higher ash samples are retained within the coal quality dataset to allow simplification of the seam model where higher ash partings become more abundant.<br>• No lower cutoff has been applied. There is an inherent minimum limit to ash samples in modern results due to a laboratory lower detection limit of 0.17%.<br>• Coal resources are reported down to a seam thickness of 0.5m (one block) with an ash cutoff of 25%. |
| Mining factors or assumptions | • Minimum seam thickness is set at 0.5m or one block in height. An ash cut-off of 25% is used for reporting resources.<br>• No other mining factors such as strip ratios, mining losses and dilutions have been applied when developing the resource model. |
| Metallurgical factors or assumptions | • BRL understands that as the majority of the reported resource has a high sulphur content, the North Buller coal will likely require blending with a low sulphur coal before a saleable product is obtained.<br>• No other metallurgical assumptions have been applied in estimating the resource. |
| Environmental factors or assumptions | • Any open pit mining and coal transport will be conducted amid environmentally and culturally sensitive areas. The project area is a likely habitat for endangered snail and kiwi species. High rainfall rates, potentially acid-generating overburden and historical acid mine drainage are all items that will have to be considered in future prefeasibility studies.<br>• Environmental values of the project area ranges from low to high. Low values relate to de-vegetated and exotic forest areas owned and managed by Ngai Tahu, and terrace and river flat pastoral farming operations. Areas of high environmental values incorporate the DoC managed Ecological Areas (Section 21 Conservation act 1987) and the Charming Creek Walkway.<br>• Current overburden characterisation testing has shown that the majority of Kaiata Mudstone overburden is acid-neutralising. This material could be used to counteract any acid forming material derived from the Brunner Coal Measures.<br>• No other environmental assumptions have been applied in developing the resource model. |
| Bulk density | • A total of 108 relative density (air dried) sample results are available for the North Buller project area taken from 19 drill holes.<br>• The relative density samples are not well distributed throughout the project area however |

| Criteria | Commentary |
|---|---|
| | the sample set covers a full range of ash values from 0.92% to 61.6%. <br>• From this dataset an ash-density curve was generated with a coefficient of determination of $R^2$=0.8982. <br><br> <br><br>**Figure 1 Ash – Density relationship for North Buller project area.** <br>• After grade estimation, density was calculated using the block ash value and the derived density equation. <br>• An in-situ density value was then computed using the Preston Saunders method. <br>• In-situ moisture determinations have been collected from drill core ply samples. |
| *Classification* | • BRL classifies resources using a multivariate approach. <br>• Coal resources have been classified on the basis of geological and grade continuity balanced by relative uncertainties surrounding historic underground extraction and proximity to faults. <br>• Closely spaced drilling with valid samples increases the confidence in resource assessments. <br>• The confidence is reduced by: <br>  o A block being within an underground worked area due to extraction rate uncertainty. <br>  o A block being within 20m of an underground worked area due to uncertainty with historic survey of the workings and georeferencing of mine plans. <br>  o A block is in an area of steep structure dip, usually in areas of large faults. <br>  o A block lies within an area of thin or splitting seam resulting in uncertainty of geological continuity. <br>• If an area is within an historically worked area the resource is considered as Inferred as a minimum. |
| *Audits or reviews* | • A comprehensive internal review of the resource model has been carried out by BRL. |
| *Discussion of relative accuracy/ confidence* | • Statistical comparisons between the resource block model and the coal quality data set have been carried out and are within expected ranges. Some anomalies exist due to non-normal data distribution. Techniques utilised include QQ plots and probability plots. <br>• No coal production is currently taking place within the resource area and therefore no reconciliation is available at this time to test the accuracy of the resource model. |

## Appendix

Maps and plans discussed within Table 1 are reported below.
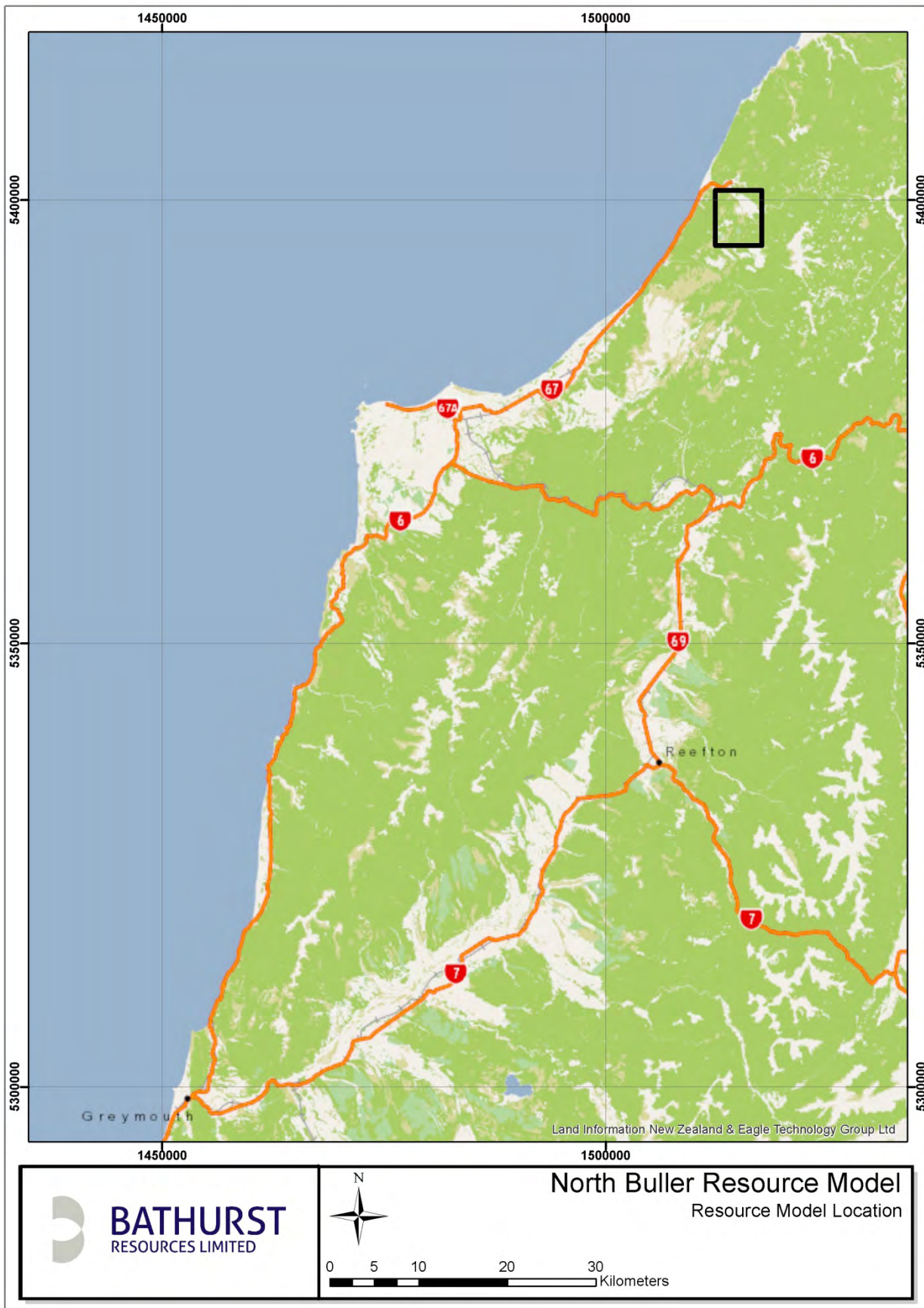


**Figure 2 Location of North Buller project and the resource model boundary.**
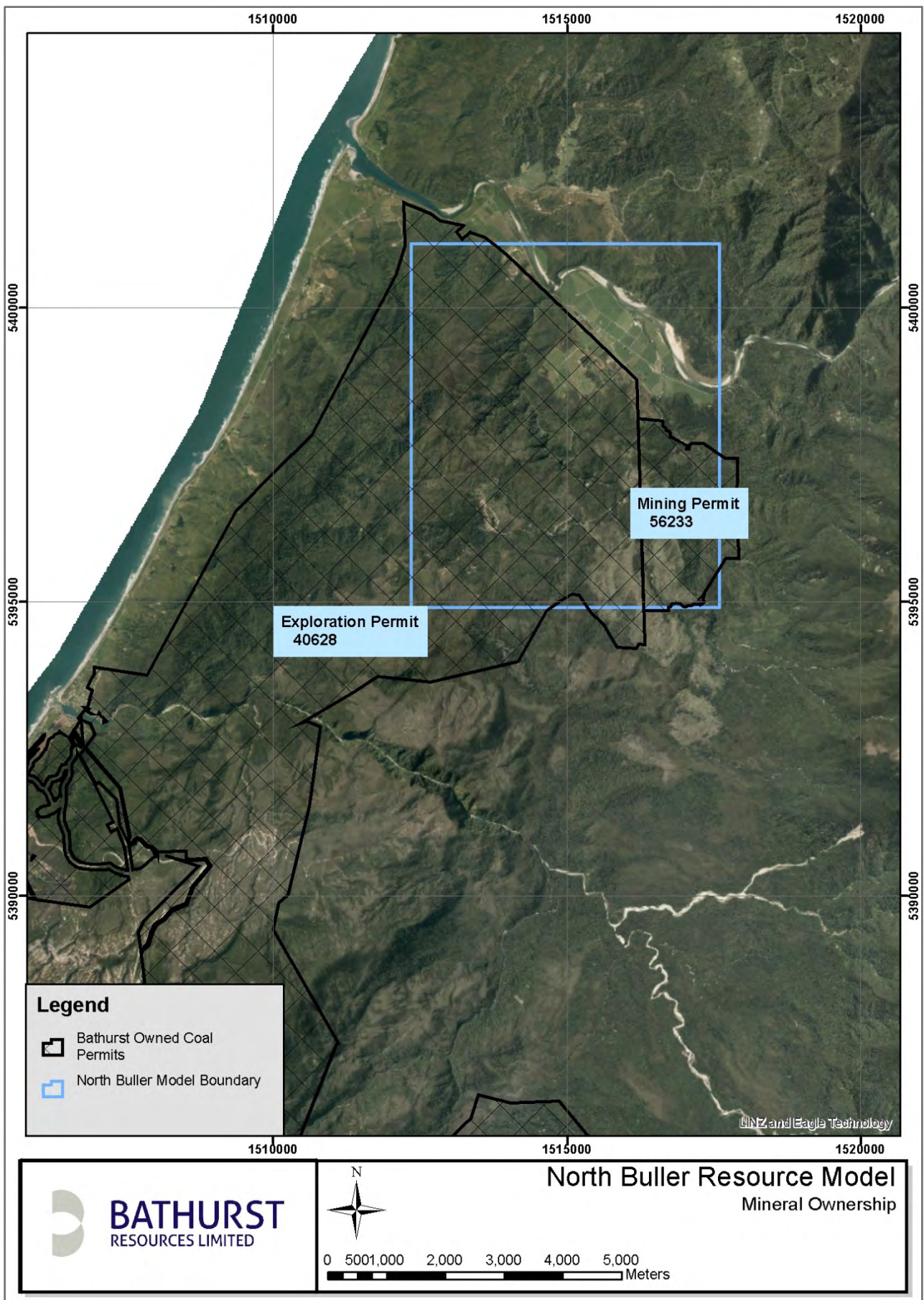
**Figure 3 Plan showing BRL owned coal permits in North Buller.**
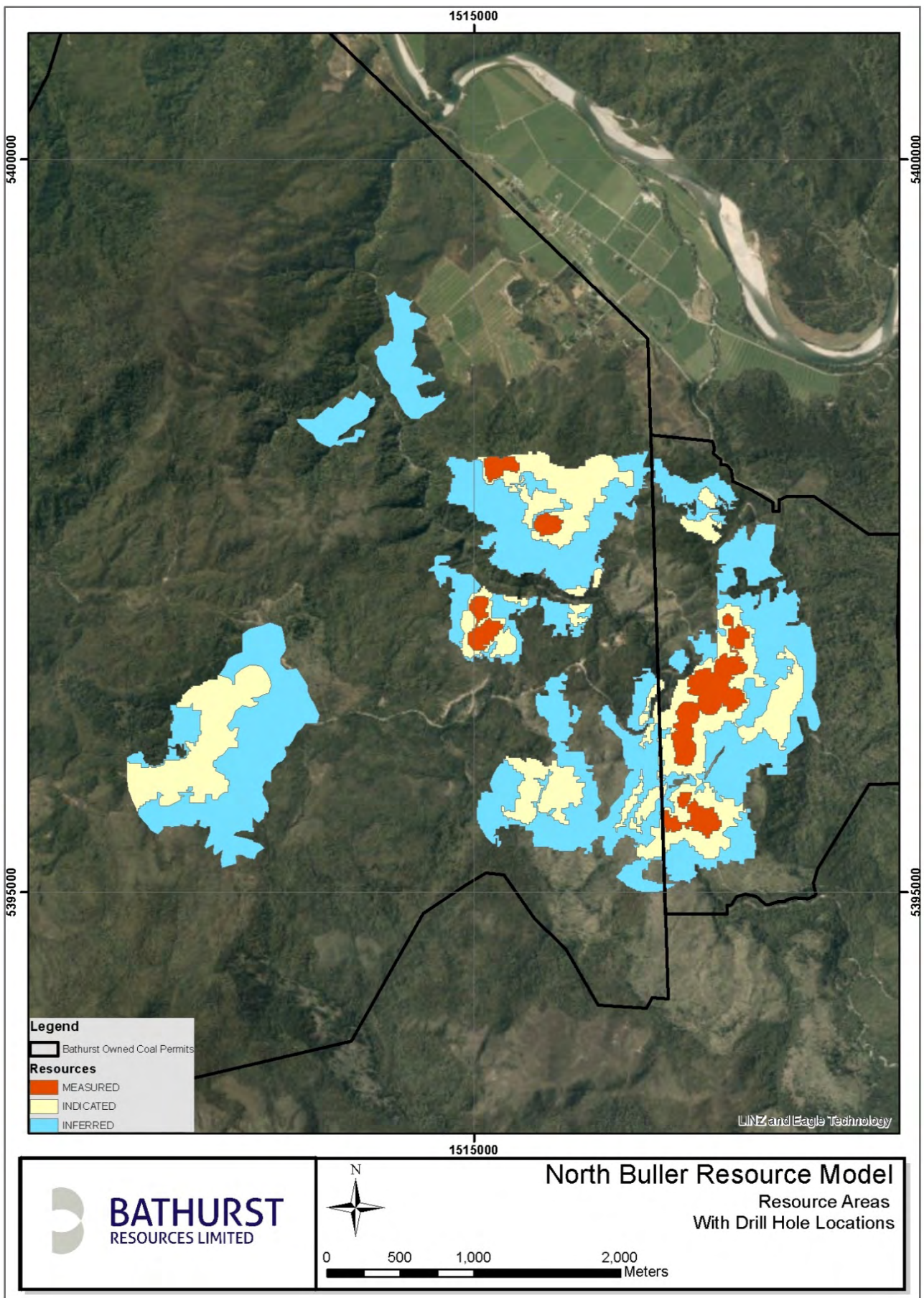
**Figure 4 Plan showing the mineral ownership and resource areas for the North Buller project.**
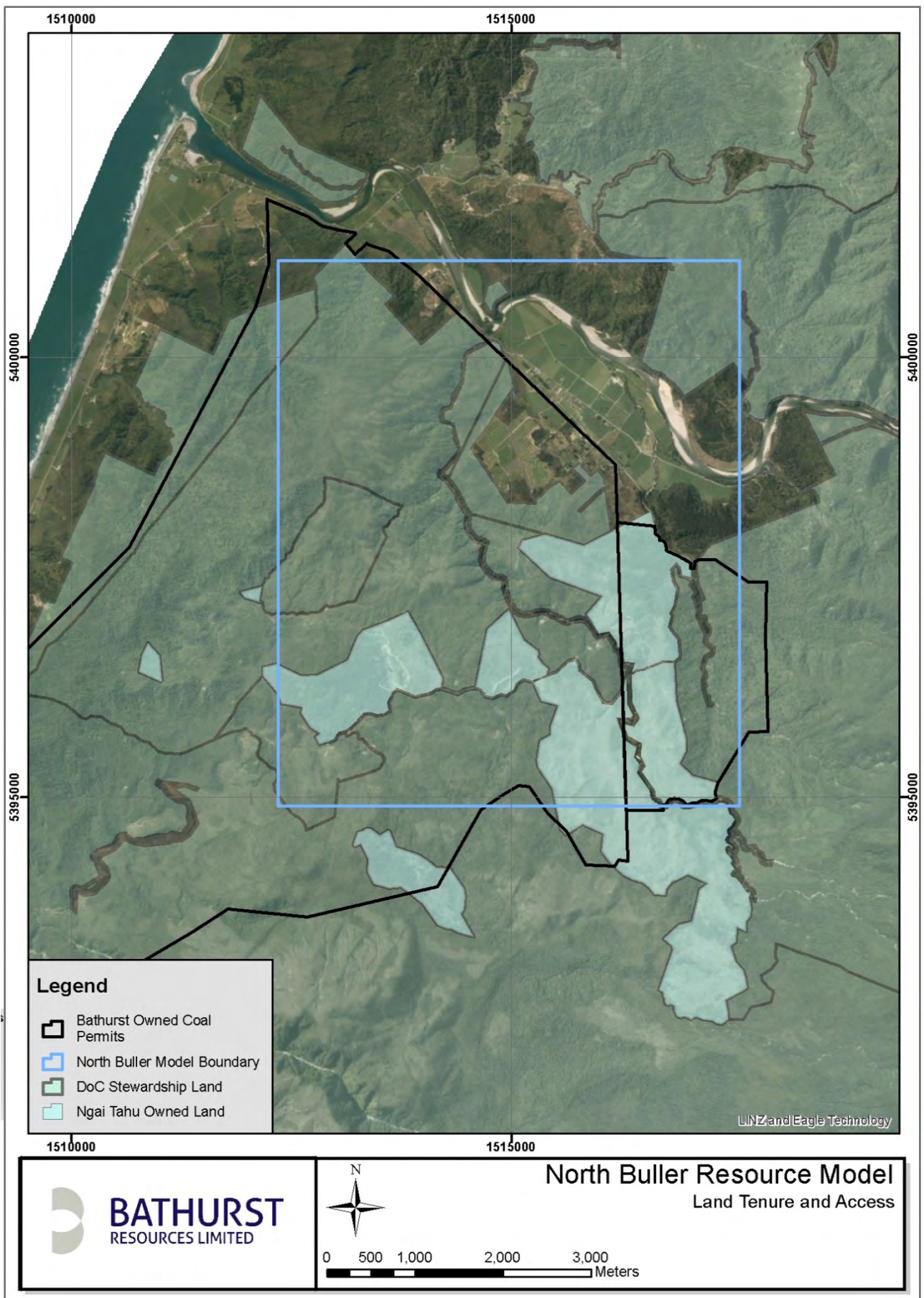
**Figure 5 Land ownership in the North Buller project area. Land titles not coloured are held by private parties or LINZ. BRL has access arrangements in place with both DOC and Ngai Tahu for exploration activities.**
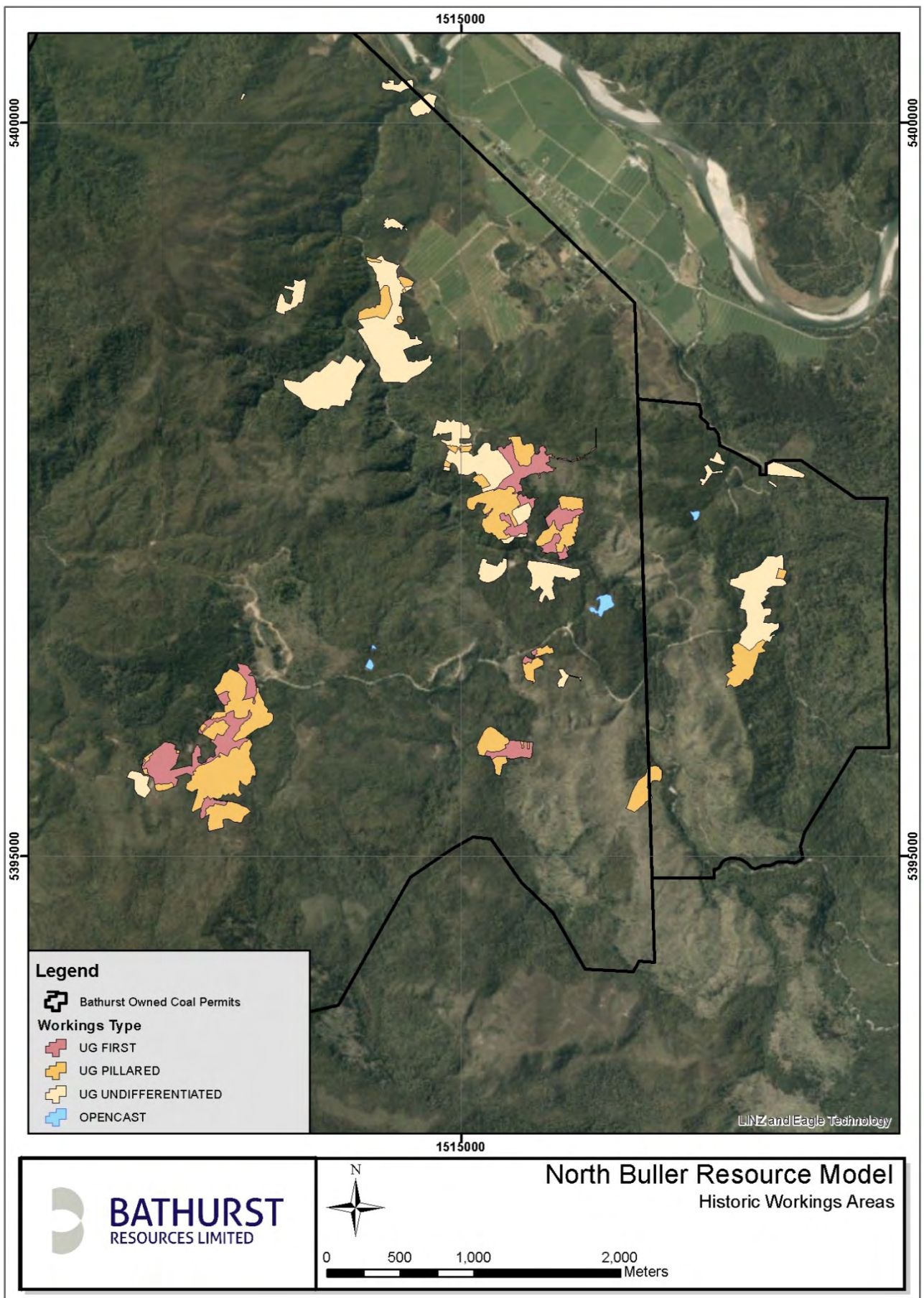
**Figure 6 There is a rich history of coal mining in the Seddonville area. This plan shows the extents of historic mining within project area.**
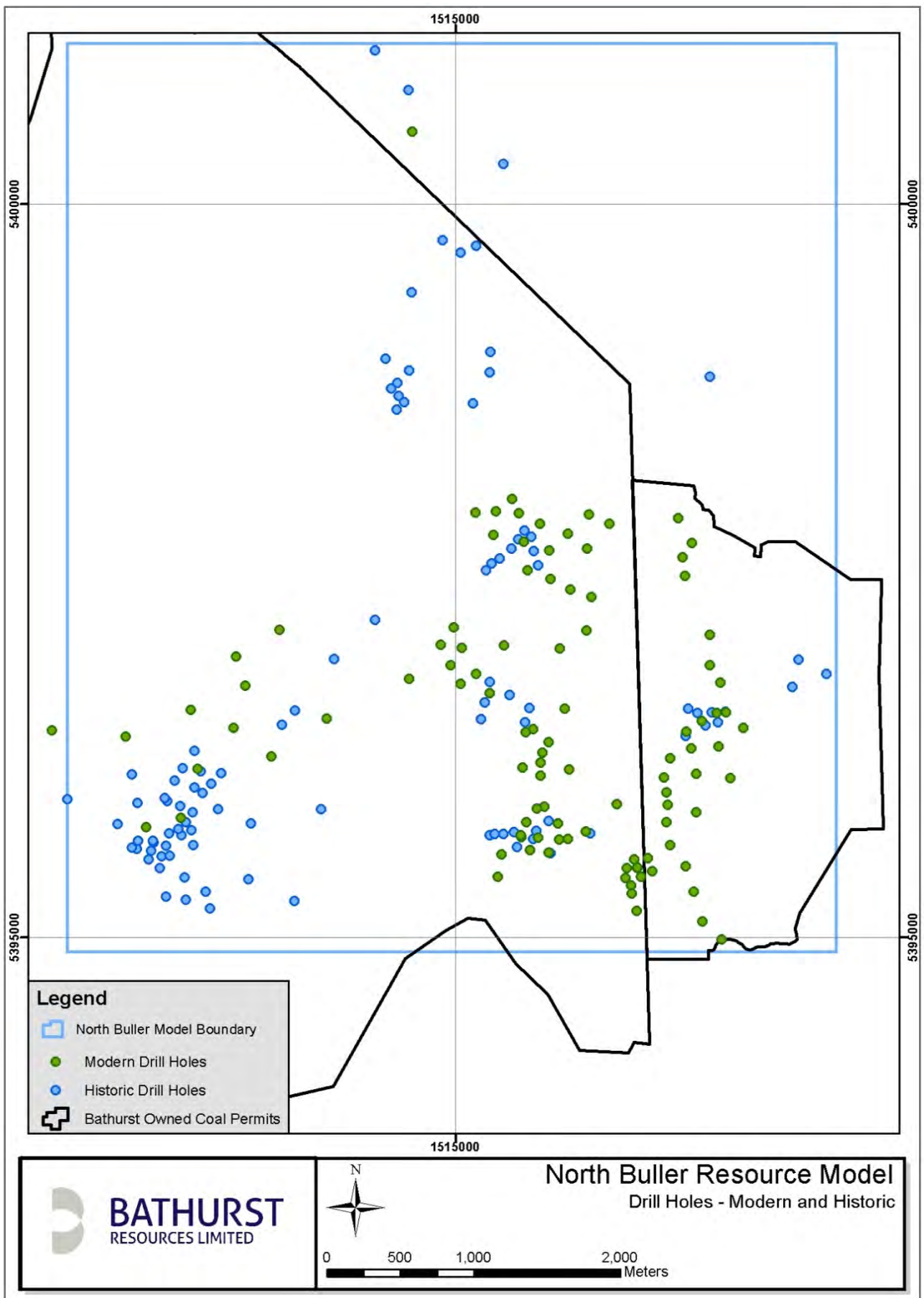
**Figure 7 Plan showing the drill hole dataset used to build the North Buller resource model**
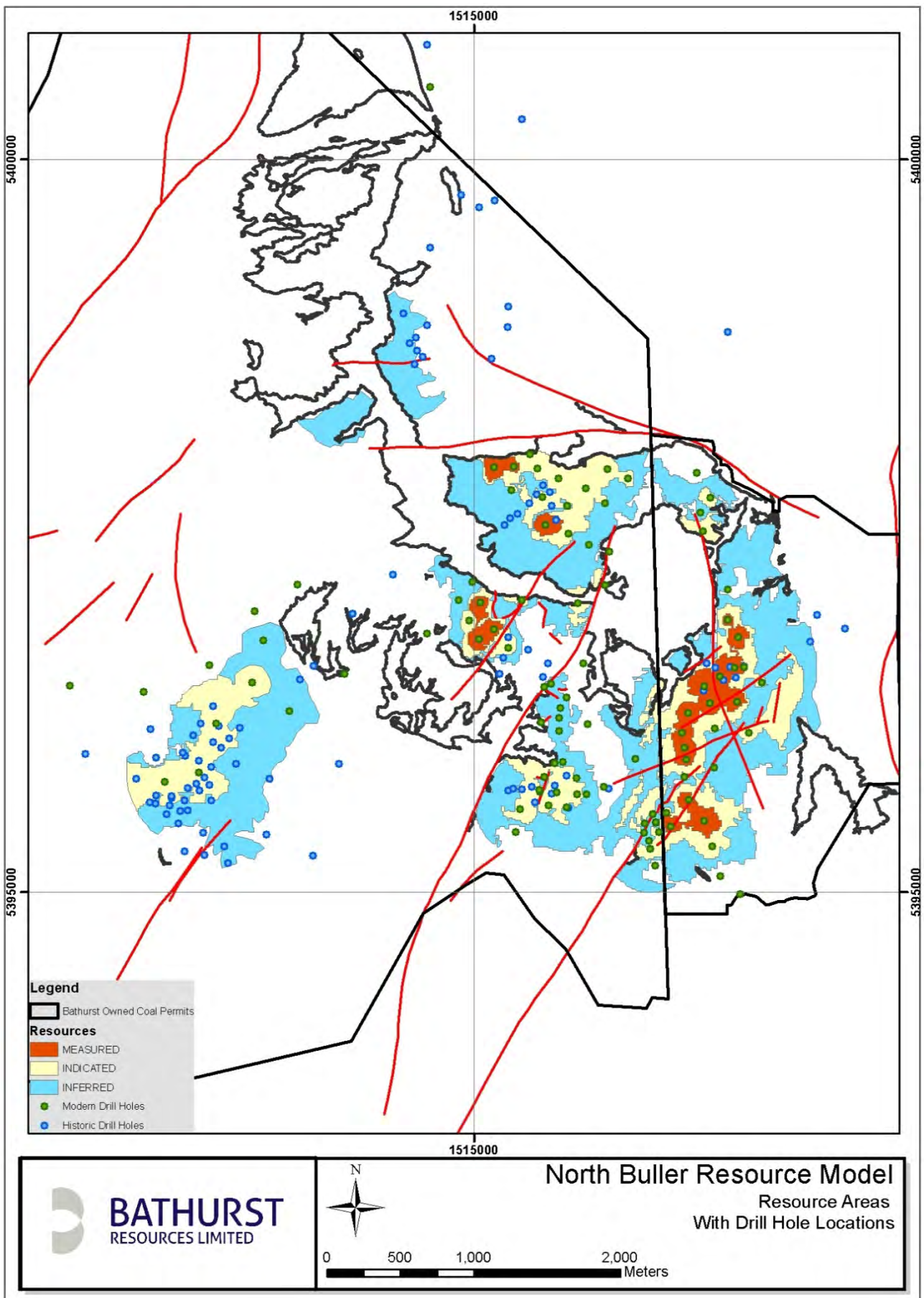
**Figure 8 Plan showing the resource classification polygons. Modelled outcrop, faults and drill holes are also shown.**
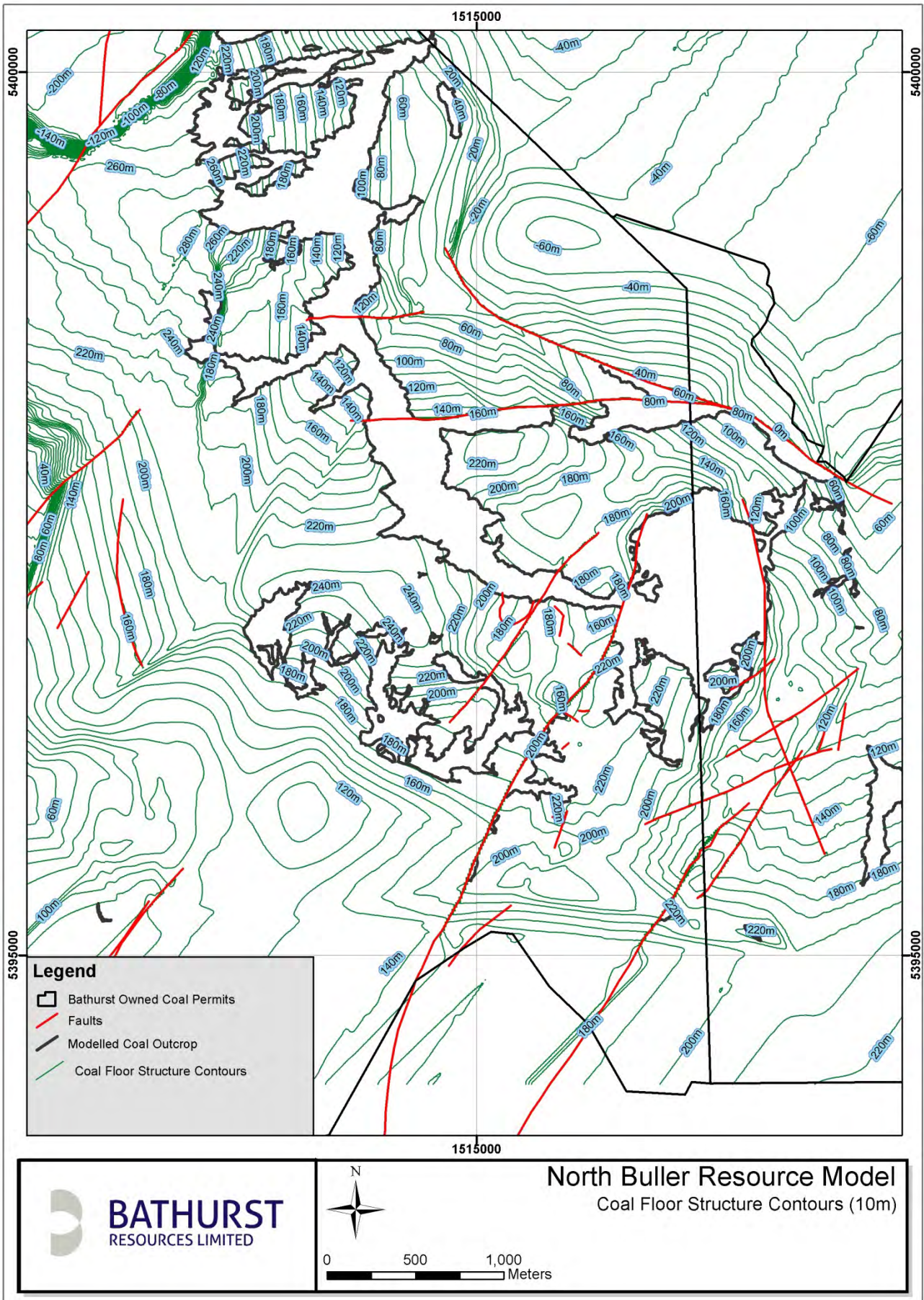
**Figure 9 Plan showing the coal floor structure contours. Contours are shown at 10m levels.**
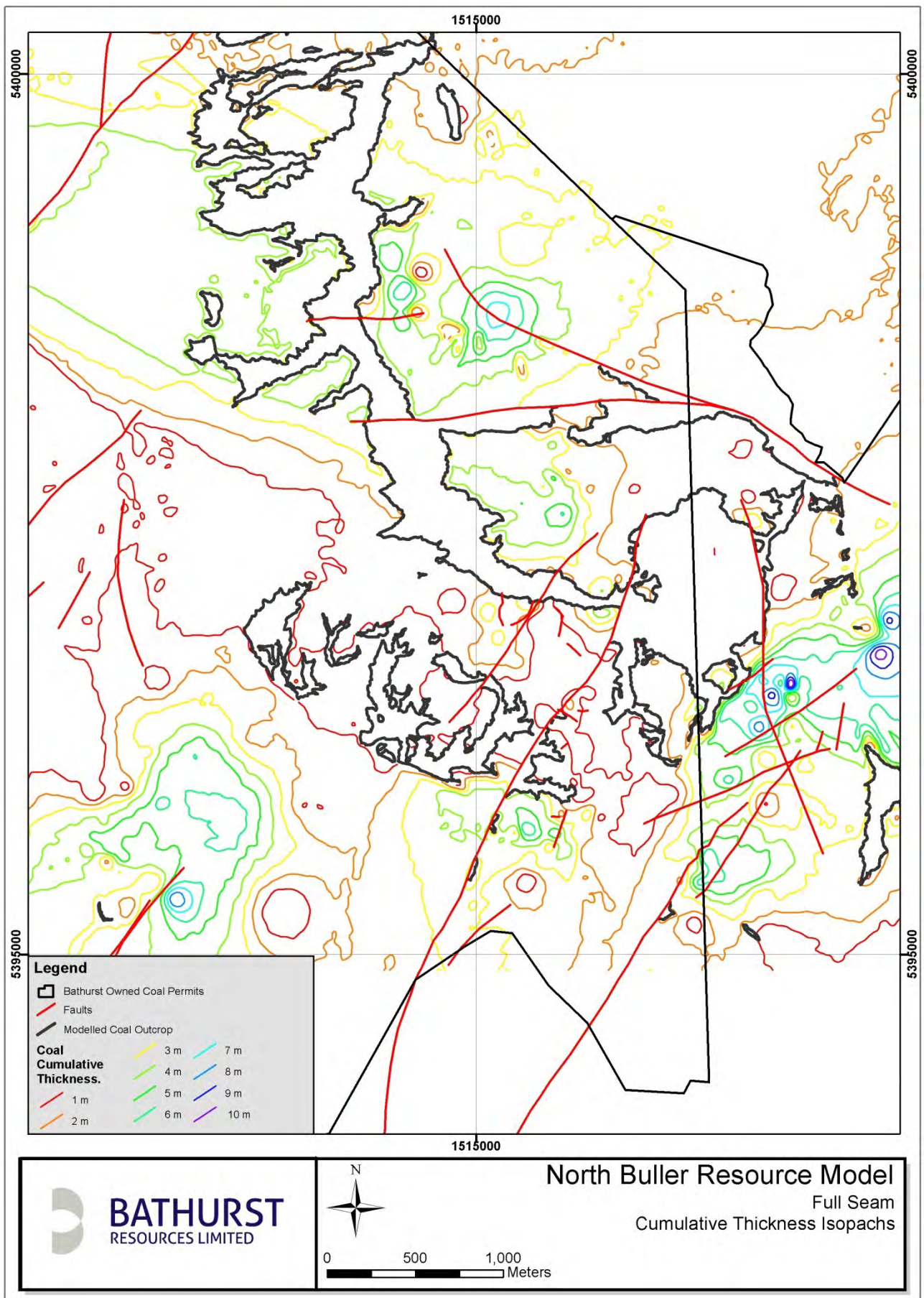
**Figure 10 Plan showing the aggregate coal thickness over the project area. Modelled coal outcrop and faults are also shown.**
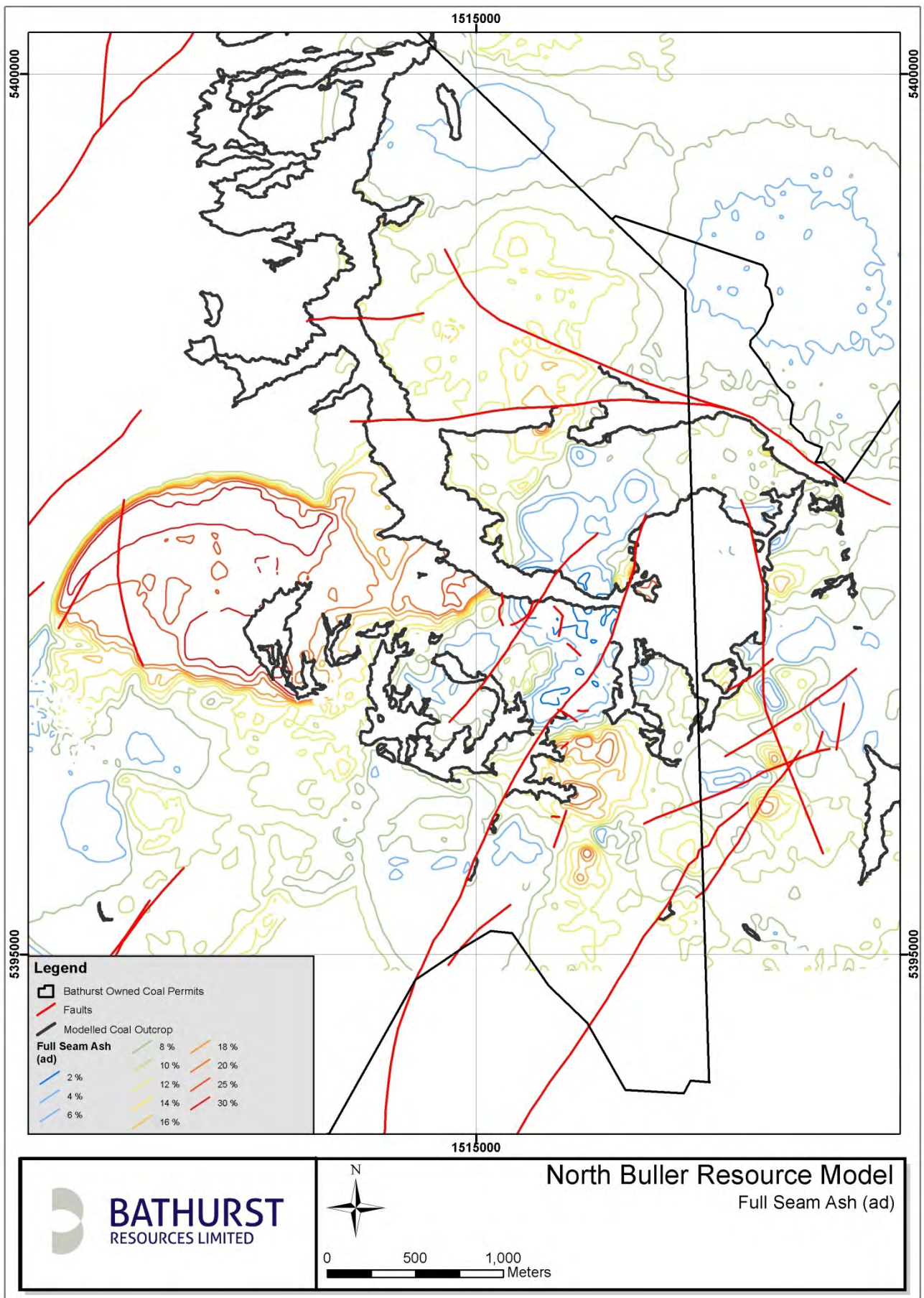
**Figure 11 Plan showing the aggregate coal seam ash on an air dried basis.**

**Legend**

Bathurst Owned Coal Permits
Faults
Modelled Coal Outcrop

**Full Seam Sulphur (ad)**

| | | |
|---|---|---|
| 3 | 4 | 5.5 |
| 3.5 | 4.5 | 6 |
| | 5 | 7 |

**North Buller Resource Model**
Full Seam Sulphur Isopachs (ad)

**BATHURST** RESOURCES LIMITED

0    500    1,000 Meters
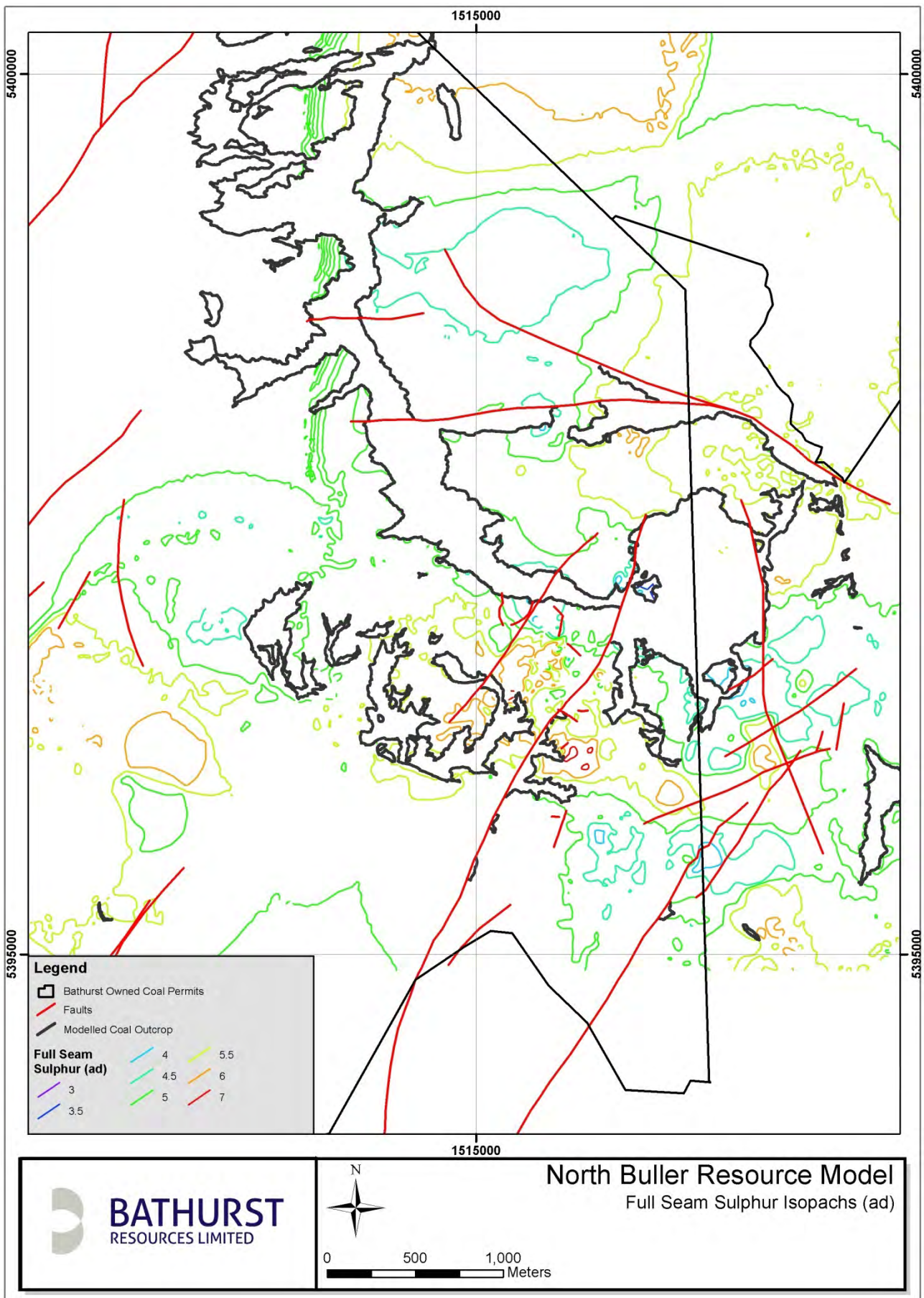
**Figure 12 Plan showing the aggregate coal seam sulphur on an air dried basis.**

# Takitimu 2016
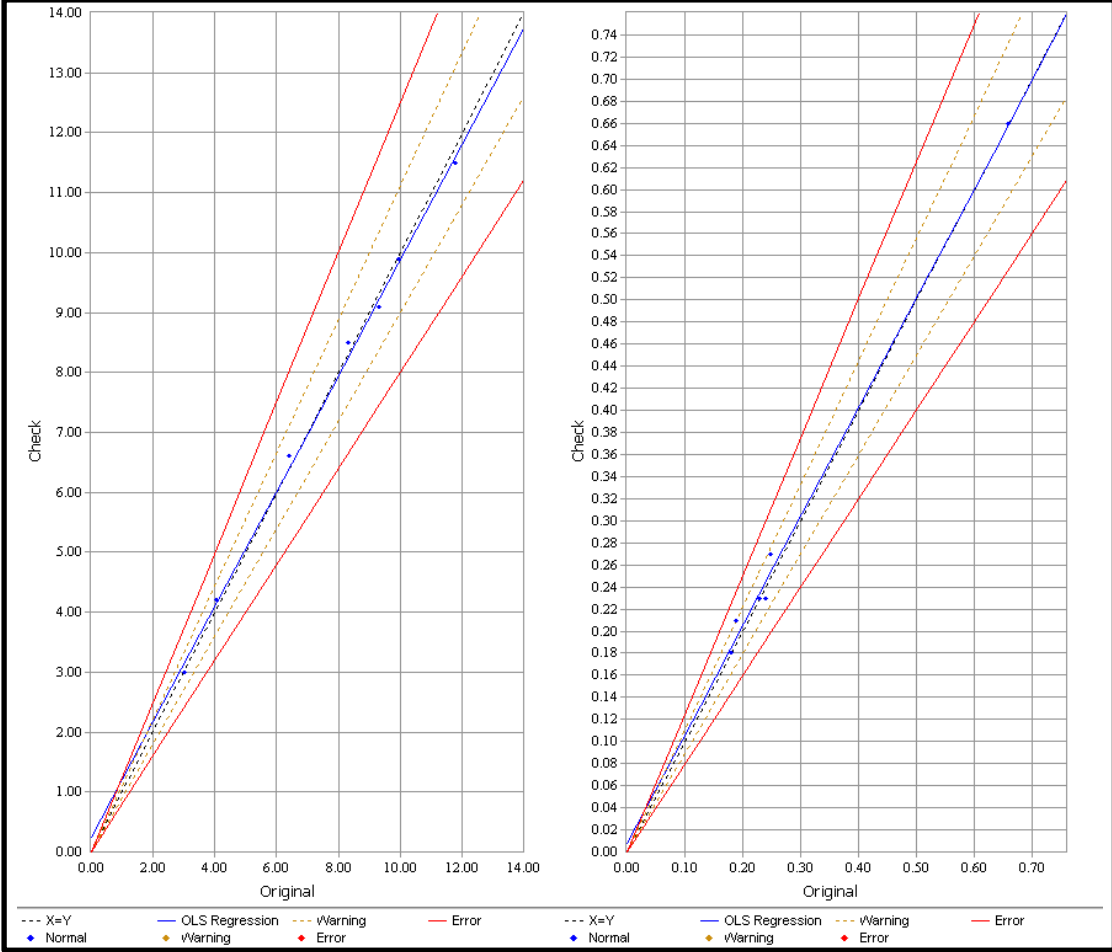
JORC Code, 2012 Edition – Table 1 report template

## Section 1 Sampling Techniques and Data

| Criteria | Commentary |
|---|---|
| *Sampling techniques* | <ul><li>Multiple campaigns of data acquisition have been carried out in the Ohai Coal field over the past century.</li><li>A combination of open-holed (wash drilled), reverse circulation, and cored drilling techniques has been used. Extensive logged and sampled trenching (channel sampling) has also been employed.</li><li>Modern exploration campaigns include data from 2006:<ul><li>32 reverse circulation hammer drill holes</li><li>2 HQ reverse circulation blade drill holes</li><li>23 wash drilled drill holes</li><li>85 HQ/PQ triple tube diamond cored holes</li><li>198 logged channel samples and trenches</li></ul></li><li>Historic drilling includes<ul><li>35 holes drilled from 1944 to 1962</li><li>14 drill holes completed in the 1980's</li><li>no down-hole geophysics data is available for these holes</li></ul></li><li>Recent drilling has aimed to infill areas to improve confidence and to test reliability of historic data. Drilling has concentrated on areas deemed closer to production therefore tighter drill spacing exists in the Takitimu and Coaldale pits compared to Black Diamond.</li><li>Down-hole geophysics are available for 63 of the modern drill holes.</li><li>Exploration drill holes are ordinarily geophysically logged provided that hole conditions and operational constraints allowed. The standard suite of tools run included density, dip meter, sonic, and natural gamma.</li><li>In-rods density produced a reliable trace for use in seam correlation and depth adjustment and is used to correlate coal seams, to confirm depths and thickness of coal seams and to validate drillers' logs. Geophysics was also used to accurately calculate recovery rates of coal intersections.</li><li>RC boreholes, drilled in 2009-2010 were geophysically logged for natural gamma with Auslog Model A051 (Combination natural gamma/single-point resistivity/spontaneous potential sonde). Calibration method used a gamma test source jig, model P6721, serial no. S705, output level 143 API units.</li><li>Diamond boreholes were geophysically logged for density with a 9034 sidewall density tool. Calibration method used for 9239 was concrete block and water tank</li><li>Outcrop trench and channel samples provide a significant proportion of the sample dataset. Coal seam thickness and partings between seams were measured vertically. Trench data is entered into the drilling database in a form that replicates a drill hole at that location.</li></ul> |
| *Drilling techniques* | <ul><li>All BRL managed drilling campaigns have utilised the following drilling methods<ul><li>Full PQ triple tube core</li><li>Full HQ triple tube core</li><li>Combination wash drill / triple tube core</li><li>Reverse circulation 133mm</li></ul></li><li>Historic drilling techniques include<ul><li>HQ triple tube core</li><li>Rotary wash, fishtail bit</li></ul></li><li>All drill holes with the exception of three geotechnical drill holes were collared vertically.</li><li>Channel sampling of faces are utilised extensively in the Nightcaps projects.</li></ul> |
| *Drill sample recovery* | <ul><li>Core recovery was measured by the core logging geologist for each driller's run (usually 1.5m) in each drill hole. If recovery of coal intersections dropped below 90% the drill hole required a redrill. Prior to 2015 drillers were paid a coal recovery incentive if coal recovery was above 90%.</li><li>Average total core recovery over the recent drilling campaigns was 90.6% with core recovery of coal at 96.2%.</li><li>Where small intervals of coal were lost, and geophysics indicated strongly that coal was lost, ash values were estimated using the results of overlying and underlying ply samples and the</li></ul> |

| Criteria | Commentary |
|---|---|
| | relative response of the down-hole density trace.<br>• Little recovery data is available for historic drill holes. |
| *Logging* | • BRL has developed a standardized core logging procedure and all core logging completed by BRL has followed this standard.<br>• All modern drill core has been geologically and geotechnically logged by logging geologists under the supervision and guidance of experienced exploration and geotechnical geologists.<br>• Drill core was photographed prior to sampling. Depth metre marks and ply intervals are usually noted on core in each photograph.<br>• Down-hole geophysical logs were used to aid core logging and adjust depth where applicable. |
| *Sub-sampling techniques and sample preparation* | • For all exploration and resource modeling data acquired by BRL an in-house detailed sampling procedure was used.<br>• Sampling and sample preparation are consistent with international coal sampling methodology.<br>• Drill core ply samples include all coal recovered for the interval of the sample. Core was not cut or halved. Ply sample intervals were generally 0.5m unless dictated by thin split or parting thickness. Coal sample size is considered adequate to be representative of the coal seam quality<br>• For historical data, sample preparation processes are unknown. However no historical drill hole coal quality results are used in the resource estimation.<br>• Trench samples were taken representatively from excavated and cleaned outcrop, preventing sampling of weathered coal and other contamination of the sample. Sample intervals were measured vertically and were generally 0.5m or less, however thicker sample intervals of up to 4m were used for thick coal seams. No field sample duplicates have been taken or analysed. Sample sizes generally aim to be at least 1kg of coal per 0.5m sampled.<br>• All diamond core samples and RC chip samples were collected as soon as practicable after drilling and bagged then sent to the SGS Minerals Laboratory in Ngakawau where they were crushed and split at the laboratory.<br>• Some grade control drill holes and channel samples have been analysed at the on-site laboratory for ash and sulphur using standards in accordance with ISO 17025 requirements for laboratory practices. |
| *Quality of assay data and laboratory tests* | • SGS has been the predominant accredited laboratory used by BRL for coal quality testing on exploration drill holes used in the resource model.<br>• SGS have used the following standards for their assay test work:<br>  o  Proximate analysis is carried out to the ASTM 7582 standard<br>  o  Ash is also reported to the standard ISO 1171<br>  o  Volatile matter has also used the standard ISO 562<br>  o  Inherent moisture has also used the ISO 5068<br>  o  Total sulphur analysis is carried out to the ASTM 4239 standard<br>  o  Calorific value results are obtained using the ISO 1928 standard.<br>  o  Loss on drying data is completed using the ISO 13909-4 standard.<br>  o  Relative density is calculated using the standard AS 1038.21.1.1<br>• CRL Energy Ltd completed much of the assay test work for samples collected prior to BRL taking over the projects.<br>• CRL used the following standards for their test work:<br>  o  Inherent moisture tests utilised the ISO 117221 standard<br>  o  Ash tests utilised the ISO 1171 standard<br>  o  Volatile matter tests utilised the ISO 562 standard<br>  o  Calorific value tests utilised the ISO 1928 standard<br>  o  Both SGS and CRL are accredited laboratories.<br>• All analysis was carried out and reported on an air dried basis unless stated otherwise.<br>• Some coal quality testing completed for BRL on in-pit channel samples and grade control drill holes used in the resource model has been carried out by the onsite laboratory which uses the following standards in accordance with ISO 17025 requirements laboratory practices:<br>  o  Sample preparation is carried out as per ISO 5063/2 brown coal and lignite's – Principles of sampling<br>  o  All coal is crushed to -3mm and a minimum of 650 grams of coal is extracted using a rotary divider.<br>  o  Coal is dried, the loss on air drying determined, and ground to -212 microns in a ring |

| Criteria | Commentary |
|---|---|
| | mill. |
| |    o  Coal is representatively spot sampled into a lab sample bottle and is then tested for inherent moisture, ash and sulphur. |
| |    o  LOD carried out as per ISO 5068-1 |
| |    o  Inherent moisture is carried out using the ISO 5068-2 |
| |    o  Ash has been analysed using the standard ISO 1171-1997. |
| | • Duplicate results from the onsite lab are compared to results tested at SGS; results are comparable between the two labs, however some differences between inherent and total moisture has been observed. No moisture results from the onsite lab are used for resource estimation however ash and sulphur (ad) results from 3 grade control drill holes and 59 channel samples are used in the grade estimation. |
| | • SGS has reviewed on-site sampling and calibration procedures in 2013 as per the initial setup of the lab in 2009. Periodic reviews and audits are completed every six months. |
| | • On-site coal sampling procedures have been audited and tested by consultant Trevor Daly Consulting in 2010 and 2013 and again in 2015. |
| *Verification of sampling and assaying* | • Sample assay results have been cross referenced and compared against lithology logs and down-hole geophysics data. Results are also inspected by experienced geologists and compared with expected values utilising known coal quality relationships for the Nightcaps coalfield. |
| | • Anomalous assay results were investigated, and where necessary the laboratory was contacted and a reanalysis undertaken from sample residue. |
| | • 6 twinned holes have been drilled at the project, but no field duplicate trench samples have been taken |
| | • In-pit channel samples have been conducted for grade control purposes; these have been used to cross validate historic and RC drilling and to provide an increased density of coal quality data for model estimation around active mining areas. |
| | • Laboratory data is imported directly into an Acquire database with no manual data entry at either the laboratory or at BRL. |
| | • Geophysical data has been used to establish coal seam thickness and depths on the margins of coal seams in RC drill holes where sampling uncertainty inherent in RC drilling made coal sample and intersection depths less reliable. |
| | • In 2014 BRL commissioned a series of duplicate samples to be completed by CRL Energy ltd. These samples have repeated tests performed by SGS New Zealand Limited (SGS) on a subset of ply samples selected at random. The results are shown in Figure 1. |

| Criteria | Commentary |
|---|---|



**Figure 1 Air dried Ash (ash ad) (left) and Sulphur (right) duplicate results comparing SGS and CRL laboratories.**

| Criteria | Commentary |
|---|---|
| *Location of data points* | <ul><li>The site currently uses the Bluff Circuit 1949 Geodetic Datum.</li><li>LiDAR and digital imagery was acquired on 10th April 2013 using an Optech M200 LiDAR system and CS8900 medium format digital camera.</li><li>The data was collected flying 1,300m above the lowest ground and using a scanner field of view of 44 degrees. Outgoing pulse rate was set at 70kHZ and minor scan frequency 33.5 Hz.</li><li>The topographic surface used to build the model is derived from a combination of Lidar data, and LINZ topographical data where Lidar coverage in outer areas is unavailable. The topographic surface is updated with end of month mine surveys for active mining and dumping areas.</li><li>The Takitimu mine has had its own survey department since 2013 and exploration data is surveyed by in house trained survey technicians. Prior to 2014 surveying was completed by BTW South based in Cromwell.</li><li>EOM surveys surveyed by aerial drone are conducted quarterly by Landpro based in Cromwell and Gore.</li><li>All in-pit surveying of coal roof and floor and channel samples has been conducted by sufficiently trained BRL staff.</li><li>Historic data has been converted from various local circuits and map grids to the Bluff Circuit 1949 Geodetic Datum.</li><li>Surveyed elevations of drill hole collars are validated against the Lidar topography and EOM survey surfaces.</li></ul> |
| *Data spacing and distribution* | <ul><li>Spacing for the Nightcaps project, including Black Diamond, Coaldale and Takitimu project areas, has been calculated by finding the radius required to fill the total area of the project divided by number of drill holes within that area.</li><li>The project has an average drill hole spacing of 150m. Channel sampling reduces this average spacing to 116m.</li><li>Takitimu project average DH spacing is 128m, and 101m including channel sampling</li></ul> |

| Criteria | Commentary |
|---|---|
| | • Coaldale project average DH spacing is 93m, and 65m including channel sampling<br>• Black Diamond project average DH spacing is 166m.<br>• Drill hole spacing is not the only measurement used by BRL to establish the degree of resource uncertainty and therefore the resource classification. BRL uses a multivariate approach to resource classification which is explained further in Section 3.<br>• The current drill hole spacing is deemed sufficient for coal seam correlation purposes.<br>• Geostatistics have been applied to the Nightcaps dataset. Variography results have been applied to grade estimation search parameters.<br>• The samples database is composited to 0.5m sample length prior to grade estimation.<br>• Any samples with composited length of less than 0.1m are not included in the estimation. Compositing starts at the top of seam and small samples are not distributed or merged. |
| *Orientation of data in relation to geological structure* | • All recent exploration drilling has been completed at a vertical orientation. The exception to this is three diamond drill holes that have been drilled with a dip of 45 degrees and azimuth of 286. These holes were drilled to assess the geotechnical properties of the western Coaldale highwall and were intended to intersect a fault.<br>• All historic drill holes are vertical; those without deviation plots are assumed to be vertical.<br>• Any deviation from the vertical is not expected to have a material effect on geological understanding due to the shallow nature of project. Average drill hole depth in the dataset is 47.7m with the deepest coal intersection of 86.4m.<br>• The majority of the deposit presents a shallow seam dip between 3° – 15° although some localized steep dips do exist near fault margins.<br>• Vertical drilling is considered to be the most suitable drilling method of assessing the coal resource in the Nightcaps coal fields. |
| *Sample security* | • Stringent sample preparation and handling procedures have been followed by BRL. Ply samples are taken and recorded from drill core, sealed in plastic and sent directly to the laboratory.<br>• It is not considered likely that individual coal samples face a risk of theft or sabotage as coal is a bulk commodity with little value for small volumes of coal from drill core. |
| *Audits or reviews* | • BRL has reviewed the geological data available and considers the data used to produce the resource model is reliable and suitable for the purposes of generating a reliable resource estimate.<br>• Senior geologists undertake audits of the sample collection and analysis processes. |

## Section 2 Reporting of Exploration Results

| Criteria | Commentary |
|---|---|
| *Mineral tenement and land tenure status* | • The Nightcaps Resource Model includes two coal permits and a privately held land parcel with coal rights attached that are wholly owned by Bathurst Coal Limited.<br>• Exploration Permit EP 51260 covers an area of 690.51 hectares, and contains a portion of the resource area. It is considered that there are reasonable prospects to convert all or part of the EP to a MiningP.<br>• Mining Permit MP53614 covers the western margin of the Coaldale opencast pit and is entirely included within the resource model. An Extension of Land (EOL) and an Extension of Duration (EOD) is currently being processed by NZPAM to expand the Mining Permit into the area covering the Black Diamond project that is currently covered by EP51260. |

| Permit/Rights | Operation | Mining Type | Expiry |
|---|---|---|---|
| **Exploration Permit 51620** | Ohai | N/A | 14/04/2020 |
| **Mining Permit 53614** | Coaldale | Opencast | 04/06/2022 |
| **Private Coal**<br><br>**Lot 1 DP 4505** | Coaldale/Takitimu | N/A | N/A |

• Royalties are paid to the Crown on coal mined from within MP53614 and an Energy Resources

| Criteria | Commentary |
|---|---|
| | Levy is paid to the crown on all coal extracted from private and crown owned coal.<br>• A deferred consideration payment of 5% of gross sales revenue at mine gate is payable on all coal produced by the company in the Ohai area. The deferred consideration is for the acquisition of the New Brighton EP40625 as announced in March 2015.<br>• BRL owns a portion of the Coaldale resources as coal rights attached to the land title.<br>• An access arrangement (AA) is in place to access a small parcel of private land in the southern portion of MP53614. There are no royalty payments included as part of this agreement.<br>• An AA is in place to access a parcel of private land in the northern portion of MP53614 and the area East of Black Diamond within EP51260. There are royalty payments included as part of this agreement. The royalty is adjusted to the PPI and LCI price indices.<br>• BRL have a sale and purchase agreement to purchase areas for mining at the Black Diamond project.<br>• BRL has a lease agreement with the Southland District Council over a large land parcel covering the Takitimu project and mine infrastructure. The lease includes rights to explore for, extract and sell coal from within the parcel.<br>• **Figure 9** and **Figure 10** in the Appendix show BRL's land ownership and access, and mineral rights within the project area. |
| *Exploration done by other parties* | • All exploration later than 2011 has been carried out by BRL<br>• Prior to the purchase by BRL, modern exploration was conducted by CRL for Takitimu Coal Limited<br>• Historic data has been traced back to original reports and logs held at Archives NZ storage centres. Historical data has been thoroughly investigated for reliability and quality and, where the integrity of the data is limited, it has been omitted from the model. |
| *Geology* | • The Project is located in the Ohai coal field, New Zealand.<br>• The Ohai coal field is a fault bounded basin containing Cretaceous sub-bituminous coal.<br>• The defined resource is contained within the Morley and Beaumont formations.<br>• The Cretaceous Ohai group contains three formations – the Wairio, New Brighton and the Morley Formations.<br>• The Eocene Nightcaps group contains two formations – the Beaumont and Orauea Formations.<br>• The two groups are separated by an unconformity clearly distinguishable by micro-flora.<br>• Most production has come from seams in the Morley formation which tend to have higher quality coal. Coal seams are faulted and folded into complex structures. Coal thickness and extent varies as seams are often lenticular and split or washed out by fluvial sand channels and syndepositional faulting and folding are indicated<br>• Morley coal measures of the Ohai Group have a combined vertical seam thickness which averages 4.1m however 23m thick seams have been recorded.<br>• Coal ranks range from sub-bituminous A to high volatile bituminous C.<br>• Beaumont coal measures of the Nightcaps Group have a combined vertical seam thickness which averages 1.4m however 7m thick seams have been recorded. Coal ranks from sub bituminous C-B rank.<br>• The Nightcaps Group Beaumont Formation coal measures are conformably overlain by Eocene Orauea Formation mudstone. |
| *Drill hole Information* | **Table 1 Showing summary of drilling data available within the model area.** |

| Years | Agency | Range of Collar ID | # Holes | Drilling Method | # Holes in structure model | # holes in quality model | Geophysics Available |
|---|---|---|---|---|---|---|---|
| 1944-1947 | Various | d133 - d144 | 9 | unknown | 3 | 0 | 0 |
| ~1955 | Various | 236-245, 247-250, 255, 372, 376 | 17 | unknown | 13 | 0 | 0 |
| 1962 | Black Diamond Colleries | 280A - 285A | 6 | WD | 6 | 0 | 0 |
| 1981 - 1984 | Coal and Energy NZ Ltd | SC101 - SC111 | 11 | Wash drilled, core | 10 | 10 | 0 |
| 1989 | Downer Mining | DMDH01 - DMDH03 | 3 | Wash drilled | 0 | 0 | 0 |
| 2006 | Takitimu Coal Ltd | NC001 - NC012 | 14 | HQ triple tube, OH | 12 | 7 | 14 |

| Criteria | Commentary | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2007 | Takitimu Coal Ltd | T001 | 1 | Trench | 1 | 0 | 0 |
| | Mar 2009 | Takitimu Coal Ltd | NC013 - NC027 | 15 | HQ triple tube, RC hammer, RC blade | 15 | 15 | 11 |
| | Feb 2010 | Takitimu Coal Ltd | NC028 - NC044 | 17 | RC hammer | 16 | 12 | 16 |
| | 2010 | Takitimu Coal Ltd | T002 - T004 | 3 | Trench | 2 | 0 | 0 |
| | Aug 2010 - Sep 2010 | Takitimu Coal Ltd | NC045 - NC060 | 16 | Triple tube core, OH, RC hammer | 11 | 9 | 8 |
| | 2012 - 2014 | Takitimu Coal Ltd | NC061 - NC078, NC086 - NC117 | 50 | triple tube core, Open holed | 48 | 29 | 13 |
| | 2013 | Takitimu Coal Ltd | T005 - T011 | 7 | Trench | 7 | 3 | 0 |
| | 2013 - 2014 | Takitimu Coal Ltd | CS001 - CS107 | 107 | Trench | 93 | 86 | 0 |
| | 2015 | Takitimu Coal Ltd | BKDT001 - BKDT043 | 43 | Trench | 11 | 6 | 0 |
| | 2014 - 2016 | Takitimu Coal Ltd | CS107- CS144 | 37 | Trench | 36 | 27 | 0 |
| | 2015 - 2016 | Takitimu Coal Ltd | NC130-NC151 | 22 | triple tube core | 21 | 19 | 1 |

|  |  |
|---|---|
| | • Exploration drilling results have not been reported in detail.<br>• The exclusion of detailed exploration data from this report is considered not to be material to the understanding of the report. |
| *Data aggregation methods* | • The nominal cut off for ash (ad) for constructing the Takitimu structure model is set at 35%.<br>• The resource model is built as a block model with 0.5m block thicknesses for coal. Coal ply data is used to grade estimate the block model.<br>• Some coal composite samples for full seam, minable sections have been taken for thorough analysis including ash constituents, forms of sulphur, ash fusion temperatures, and ultimate analysis. These composite samples are not used in grade estimation. |
| *Relationship between mineralisation widths and intercept lengths* | • All exploration drill holes have been drilled vertically and the coal seams are generally gently dipping. Therefore any reported seam intercept thickness is representative of the true seam thickness. |
| *Diagrams* | • Coal quality isopach plots and coal structure contour plots for both Morley and Beaumont coal are shown in the appendix. |
| *Balanced reporting* | • Not applicable. Detailed exploration drilling results and coal intersections has not been reported. |
| *Other substantive exploration data* | • Exploration drilling results have not been reported in detail.<br>• The Coaldale pit is in commercial production.<br>• Substantial ash constituent data has been compiled on coal samples and coal composite samples for the Coaldale and Black Diamond Prospects. |
| *Further work* | • Further infill drilling and geotechnical drilling is planned around the Black Diamond prospect. |

## Section 3 Estimation and Reporting of Mineral Resources

| Criteria | Commentary |
|---|---|
| *Database integrity* | • All historic and legacy datasets have been thoroughly checked and validated against original logs and results tables. Where reliability of the data is poor the data is excluded from the modelling process.<br>• BRL utilises an Acquire database to store and maintain its geological exploration dataset.<br>• An Acquire database places explicit controls on certain data fields as they are entered or imported into the database such as overlapping intervals, coincident samples, illegal sample values and standardised look-up tables for logging codes etc.<br>• Manual data entry of assay results is not required as results are imported directly. |

| Criteria | Commentary |
|---|---|
| | • The database is automatically backed up on an off-site server. |
| *Site visits* | • Hamish McLauchlan (the Competent Person) has worked for the past 20 years on coal projects throughout New Zealand. The Competent Person visits the sites regularly. |
| *Geological interpretation* | • BRL has confidence in the geological model and the interpretation of the available data. Confidence varies for different areas and this is reflected by the resource classification.<br>• Dry, mineral matter and sulphur free volatile matter is the principal quality used to differentiate and correlate Beaumont and Morley coal seams.<br>• BRL considers the amount of geological data sufficient to estimate the resource however an increased data density may increase confidence of some areas.<br>• Uncertainty surrounds the historic underground and opencast workings, both in the quality and quantity of coal extracted and the surveying of underground workings. This is reflected in the resource classification.<br>• Some residual uncertainty of quality and confidence of historic drilling data remains despite thorough evaluation of the historic logs and drill locations. |
| *Dimensions* | • A number of coal seams are present with two main seams in the Beaumont formation and up to four in the Morley formation. The total combined coal thickness varies from less than 1m thick up to 25m thickness locally.<br>• The model covers a 2.4km by 3.6km area. The deposit consisting of the Takitimu, Coaldale and Black Diamond prospects covers an area approximately 230Ha. The deposit is bounded by the Tinker Nightcaps fault to the North East and the Fern fault to the North West. The Takitimu deposit is separated from the Coaldale and Black Diamond deposits by the Trig E fault. |
| *Estimation and modeling techniques* | • All available and reliable exploration data has been used to create a geological block model which has been used for resource estimation and classification.<br>• All exploration drilling data is stored in Acquire and exported into a Vulcan drill hole database. Mapping data is stored in Acquire and is exported into Vulcan.<br>• Interpretive design data is stored within Vulcan in various layers.<br>• Due to the model having two unconformable coal bearing formations the model is subdivided into two separate domains of formation (Morley and Beaumont). The Morley seams are truncated by the overlying unconformable Beaumont coal measures.<br>• The model is domained further into two fault blocks (North, South) using the large Trig E, Fern, and the Tinker/Nightcaps faults as bounding surfaces.<br>• Each domain is modeled for structure and grade separately.<br>• Vulcan is used to build the structure model. Grid spacing is 10m x 10m.<br>• Maptek's Integrated Stratigraphic Modeler module is used to produce the structure model. The stacking method is used which triangulates a reference surface and then stacks the remaining horizons by adding structure thickness using triangulation.<br>• Structure grids are checked and validated before being used to construct the resource block model.<br>• Vulcan is used to build the block model and to grade estimate. The process is automated using a Lava script.<br>• The stratigraphic structure grids for each domain, along with end of month site survey combined with lidar topography surface, Beaumont unconformity surface, and other mining related surfaces for Coaldale and Takitimu were used to build the block model. The block dimensions are constructed at 10m x 10m. Vertical thickness for coal blocks is 0.5m.<br>• Grade estimation is performed utilising Vulcan's Tetra Projection Model. Beaumont seams and Morley seams are estimated in the North and South domains. Coal qualities are estimated on an air dried basis. Ash, moisture, volatile matter, and calorific value are estimated simultaneously. Sulphur is estimated using a different search ellipse as indicated by geostatistics. Variability in sulphur may be related to post depositional fluid flow in NE-SW trending fault structures. Sulphur is shown to be elevated in close proximity to these fault zones. Sulphur grade estimation in the North fault block is subdomained in proximity to one of these faults.<br>• Geostatistics of the coal quality dataset has been examined to determine any spatial relationships and define the estimation search parameters for each coal seam quality and thickness. The maximum search radius is set to the maximum range of influence found in the semi-variogram for ash dependent variables and for sulphur. |

| Criteria | Commentary |
|---|---|
| | <ul><li>Grade estimation is computed using an inverse distance cubed function for ash dependent qualities, and inverse distance squared function for sulphur.</li><li>Various methods have been used to check the validity of the block estimation. This includes manual inspection of the model, QQ plots of the model qualities vs coal quality database and other comparison tools.</li><li>Mining reconciliation has been completed on the resource model to check model accuracy within the Coaldale mining area. To date, the results are within the bounds of expected variability based on resource classification used with mining factors applied. No other bulk reconciliation has been completed.</li><li>Resource tonnages within the model have been discounted where the resource falls within historic underground workings areas. The primary underground mining method utilised historically in the Nightcaps area is bord and pillar mining. Extraction rates using this type of mining generally reduce as seam thickness increases. Historic extraction rates are estimated using old mining extraction reports, and work completed by Yardley et al 1986.</li></ul> |
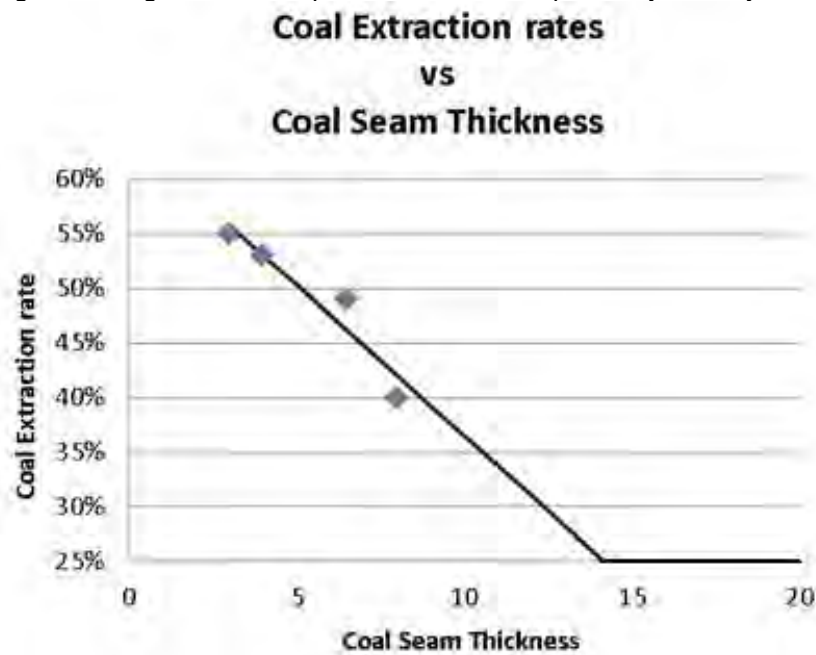


**Figure 2 Historic underground extraction rates applied to areas of underground workings based on coal seam thickness**

- Opencast mining was also undertaken in the Nightcaps project.
- The extraction rates used to discount coal tonnages in the resource model are as follows:

| Mining Method | Extraction Rate |
|---|---|
| Underground workings | Morley coal discounted at rate shown in Figure 2 with a minimum rate of 25% extracted. Beaumont coal discounted by 10% due to collapsed ground. |
| Opencast | 100% of all coal seams |

- Reconciliation data from the Takitimu pit supports these extraction rates on a medium to long term basis.
- Behre Dolbear Australia Pty Limited (BDA) notes that Bathurst has adopted a procedure over old workings of discounting the estimated resources to account for the depletion of coal from underground mining and due to possible structures not identified by drilling. Based on reconciliations from mining to date at Takitimu, this approach has been established as a reasonably reliable, if somewhat conservative, method of estimating resources where there are clearly areas of depletion. BDA accepts that this appears to be a reasonable approach but cautions there will be areas where the resources may differ from the estimates.
- No acid mine drainage occurs at the Coaldale and Takitimu operations due the nonacid forming lacustrine depositional environment of the coal measures and therefore acid

| Criteria | Commentary |
|---|---|
| | generation models have not been completed. |
| *Moisture* | • Moisture, both on an air dried and total moisture basis, is estimated into the resource model from the sample database after using a cutoff envelope to cut samples that vary excessively from the norm. Natural variability in bed moisture is amplified by excessive variability in the sampling process and laboratory testing methods.<br>• The cutoff envelope used was derived from ±0.67 times the standard deviation of the dataset. The diagrams below show the envelope used for Morley and Beaumont coal. |
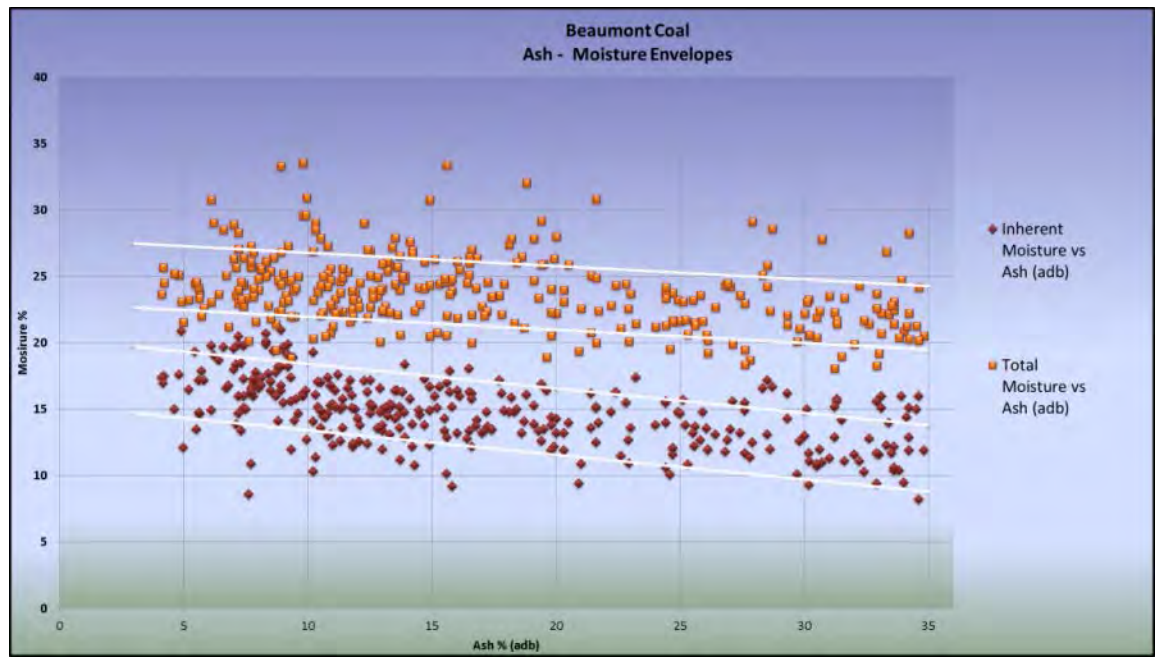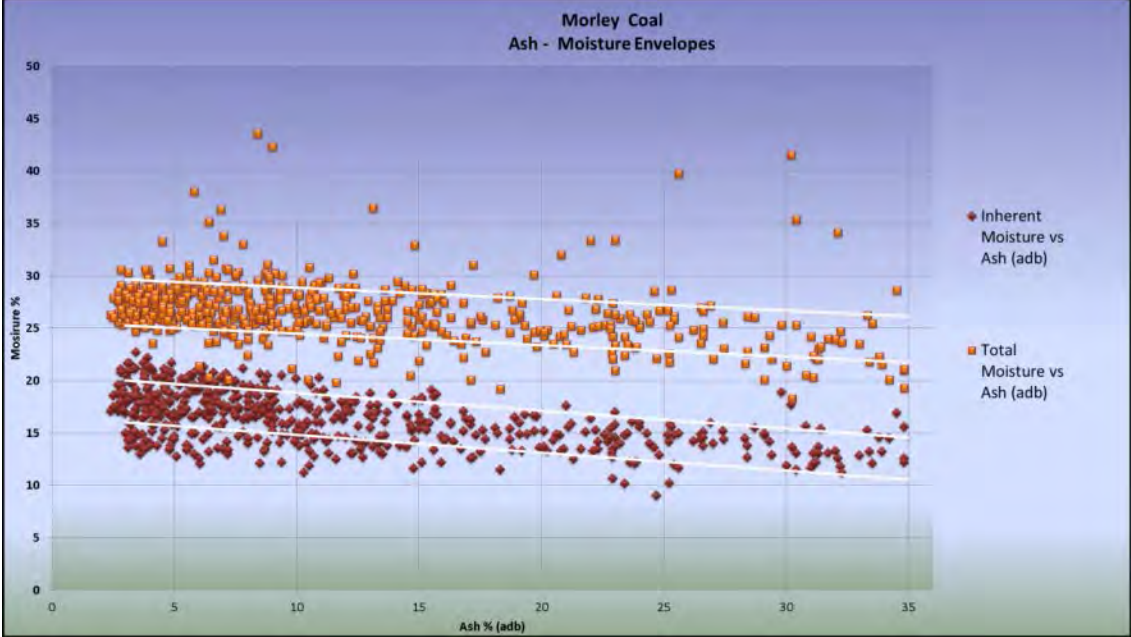


**Figure 3 Inherent moisture and total moisture cutoff envelopes for Beaumont coal**

| Criteria | Commentary |
|---|---|



**Figure 4 Inherent moisture and total moisture cutoff envelopes for Morley coal.**

- This technique compares favourably to the Run of Mine coal sampling data from Coaldale and Takitimu open pit operations, and provides a more accurate representation of coal bed moisture than using a single value for total moisture across the deposit and estimating qualities on a dry basis.
- Resource tonnages are reported using natural bed moisture, calculated using the Preston Sanders equation.

| Criteria | Commentary |
|---|---|
| *Cut-off parameters* | - Structure grids have been developed based on a 35% ash cutoff. Some higher ash intervals are retained within the coal quality dataset to allow simplification of the seam model.<br>- No lower ash cutoff has been applied.<br>- Moisture data has an upper and lower cutoff applied as described in the previous section.<br>- Coal resources are reported down to a seam thickness of 0.5m (one block) with an ash cutoff of 25%.<br>- Resources have been defined as economic by using a breakeven Lerchs-Grossman optimised pit shell using budgeted mining costs and contracted coal sales values. No resources have been reported outside of this pit shell. |
| *Mining factors or assumptions* | - The Coaldale pit is in commercial production utilising truck and excavator mining.<br>- Long term coal sales contracts are tied to inflation (Labour Cost Index, Producers Price Index) for the mining industry.<br>- No other mining factors such as mining losses and dilutions have been applied when developing the resource model. |
| *Metallurgical factors or assumptions* | - No metallurgical assumptions have been applied in estimating the resource as there is currently no wash plant required at the Coaldale operation. It is not expected that a wash plant would be required for future coal processing. |
| *Environmental factors or assumptions* | - No environmental assumptions have been applied in developing the resource model.<br>- The Coaldale pit is currently in commercial production and there is a large area available for waste disposal.<br>- Overburden has been shown not to be acid forming. |
| *Bulk density* | - A total of 89 relative density (air dried) sample results are available for the Morley coal, and 38 samples are available for Beaumont coal.<br>- The samples are distributed throughout the Takitimu-Coaldale-Black Diamond project area and the sample set covers a range of ash values from 3.8% to 50.3%.<br>- From this dataset an ash-density curve was generated with a coefficient of determination of |

| Criteria | Commentary |
|---|---|

$R^2 = 0.87$ for Morley Coal, and $R^2 = 0.94$ for Beaumont coal.
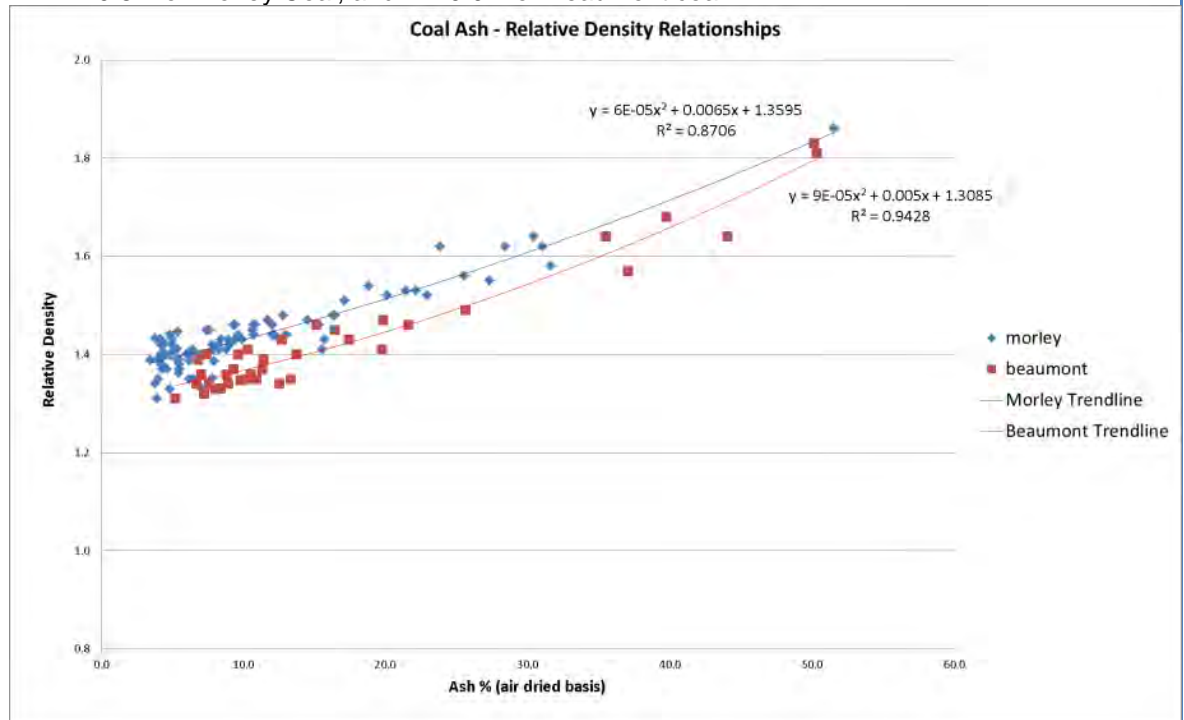


**Figure 5 Graph showing Ash (ad) - Relative Density (ad) relationship for both Morley and Beaumont coal**

- Air dried density is calculated using the air dried block ash value and the derived density equations.
  Morley coal:         Density (ad) = (0.00006 * $ash^2$ ) + (0.0065 * ash) + 1.3595
  Beaumont coal:     Density (ad) = (0.00009 * $ash^2$ ) + (0.005 * ash) + 1.3085

- An in-situ bulk density value is computed using the Preston Saunders method;
  Density (ps) = (RD * (100 – mo_ad)) / (100 + RD*(mo_ar - mo_ad)- mo_ar)
  Where RD is relative density on an air dried basis, mo_ad is inherent moisture, and mo_ar is total bed moisture.

- The Coaldale pit is in commercial production and reconciliations have confirmed density estimates.

| | |
|---|---|
| *Classification* | • BRL classifies resources using a multivariate approach. |

- BRL classifies resources using a multivariate approach.

- Coal resources have been classified on the basis of geological and grade continuity balanced by relative uncertainties surrounding historic underground extraction, historic fire affected areas and proximity to faults and unconformities.

- Closely spaced drill holes with valid coal quality samples (point of observation) increases the confidence in resource assessments.

- The confidence is reduced by:
  - A block being within an area of historic underground workings due to extraction rate uncertainty.
  - A block being within 20m of historic underground workings due to uncertainty with historic survey of the workings and georeferencing of mine plans.
  - A block lying in an area where structure dip is greater than 20° due to proximity to large faults. Faulting can impact coal thickness and quality and some faults are poorly constrained.
  - A block lying within an area with thin or splitting seams resulting in uncertainty of geological continuity. Where a seam is thin or is splitting, a small change in thickness can have a large impact to reported vs actual coal tonnages and qualities.
  - A block being within an area close to a possible 'washout' or erosion of Morley coal

| Criteria | Commentary |
|---|---|
| | as indicated by historic underground mine plans and extents. |

     o   A block lying within an area identified to be affected by historic underground mine fires.

     o   A block underlies the modelled regional unconformity between Beaumont and Morley formations by less than 2m due to uncertainties in unconformity surface topology.

- Essentially, in an area that is not affected by the above conditions, a distance to nearest sample of less than 75m would be classified as Measured, less than 150m is classified as Indicated and less than 500m would be classified as Inferred.

- The following figures show the resource classification polygons for Morley and Beaumont Coal. Economic resources are reported from within these polygons provided they lie within the breakeven Lerchs-Grossman optimized opencast pit shell.
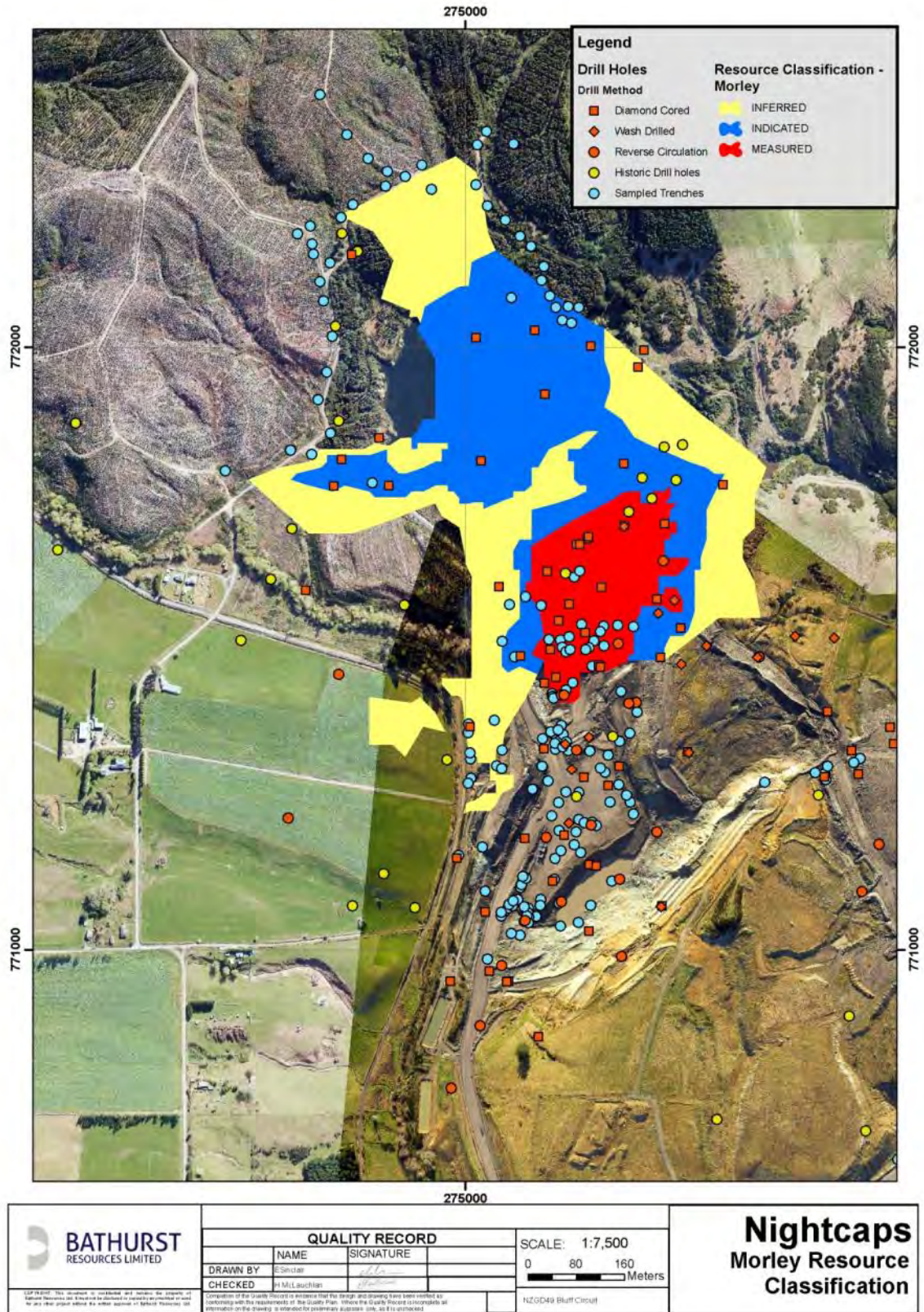
**Figure** 6 **Morley Coal Resource Classification Areas**

| Criteria | Commentary |
|---|---|
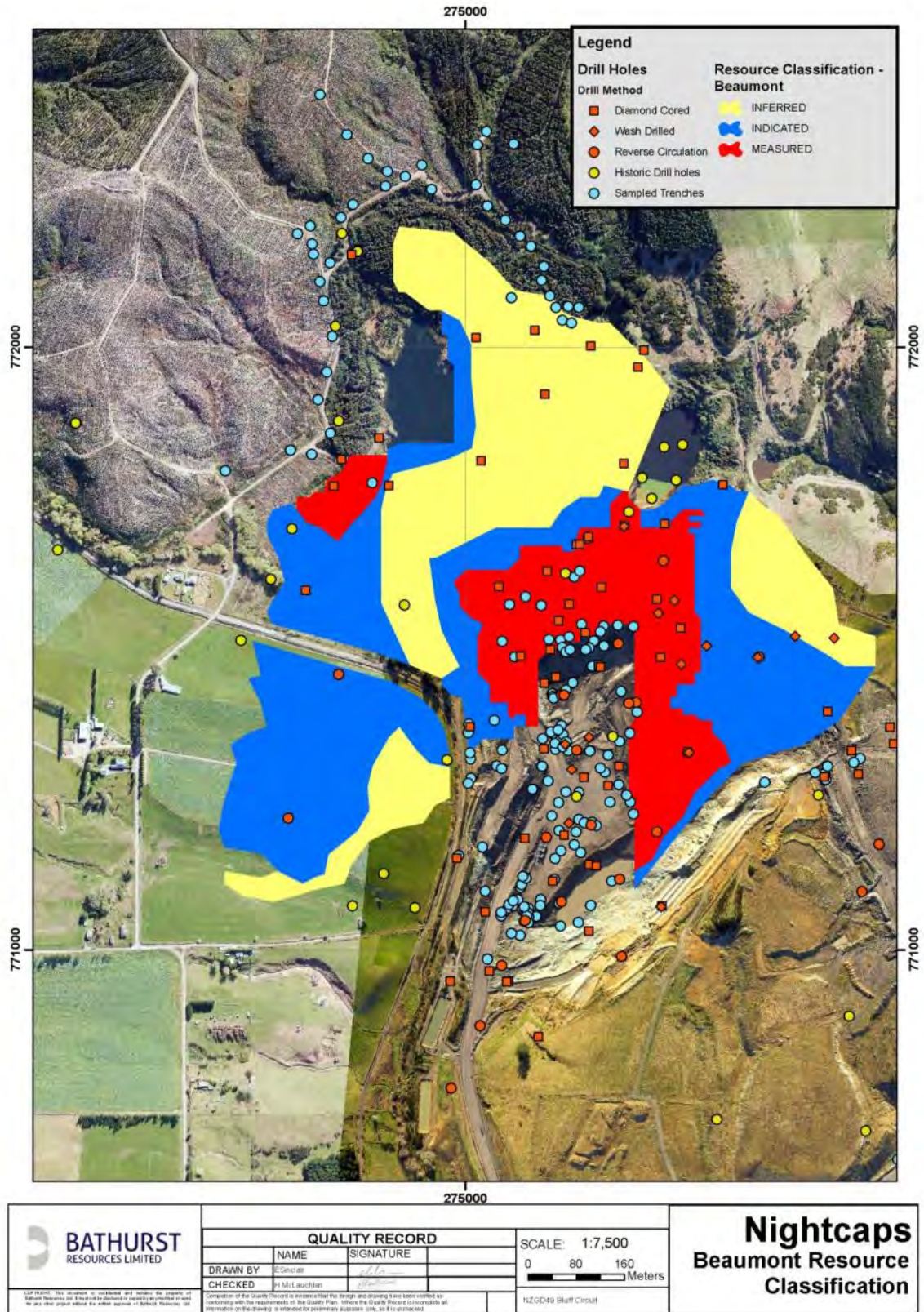


**Figure 7 Beaumont Coal Resource Classification areas**

| Criteria | Commentary |
|---|---|
| Audits or reviews | • A comprehensive internal review of the resource model has been carried out by BRL. |
| | • The model has been thoroughly reviewed by BRL mine planners and Core Mining Consultants as part of the mine planning for Coaldale operations and the Black Diamond project. |
| | • The 2016 Resource Model represents an update to the 2014 Resource Model and incorporates all the drilling and exploration data to 30th June 2016 |

| Criteria | Commentary |
|---|---|
| *Discussion of relative accuracy/ confidence* | • The Competent Person has reviewed the resource estimates and has visited the existing Coaldale and Takitimu operations as well as proposed developments at Black Diamond. The Competent Person has examined the methodology used to estimate the resources and reserves and is satisfied that the processes have been properly conducted. The estimation methodology is generally in accordance with, if not at a higher standard to, industry practice and the estimates can be regarded as compliant under JORC 2012.<br>• Statistical comparisons between the resource block model and the coal quality data set have been carried out and are within expected ranges.<br>• The Coaldale mine utilises the resource model modified to a reserve model for mine planning and scheduling. Production reconciliation for the 3 years of Coaldale production completed in July 2015 shows that ROM coal produced reconciles to within 10% of the expected coal resources defined by the model. Classification of mined coal in this period was split evenly between Measured and Indicated coal. |

Takitimu Section 4 Estimation and Reporting of Ore Reserves

| Criteria | Commentary |
|---|---|
| *Mineral Resource estimate for conversion to Ore Reserves* | • A 3D Resource Block model of topography, structure and quality are used for -situ Resource definition.<br><br>• Mineral Resources are inclusive of Ore Reserves |
| *Site visits* | • The Reserves Competent Person visits the site regularly. |
| *Study status* | • Takitimu is an operating mine project. The reportable Ore Reserve is based on the life of mine (LOM) plan and has determined a mine plan that is technically achievable and economically viable, and where material modifying factors have been considered. |
| *Cut-off parameters* | • Pit optimisation runs were completed to determine economic pit limits<br><br>• BRL supplied cost and revenue data.<br><br>• A maximum ROM ash of 15% (arb) and a minimum coal thickness of 0.5m are applied. |
| *Mining factors or assumptions* | • The Takitimu mining area has been operational since 2007, with the current Coaldale pit starting in 2012. Costs and prices are derived from actual and budget. Hence, a Feasibility Study was not completed.<br><br>• Mining recovery of 90% is applied to the in-situ coal. Periodically, the ROM coal production is reconciled against depletion of the mining model. Reconciliation to date shows more coal produced than modelled from the same areas.<br><br>• The Takitimu mine utilises truck and shovel for waste and coal movement. The operations are supported by additional equipment including dozers, graders, and water carts.<br><br>• Geotechnical studies have been completed for Coaldale and will be required for Black Diamond prior to development.<br><br>• Moisture Adjustments: Moisture is modified during both the mining and processing operations. In-situ moisture is determined by the process described in Section 3 and is the base point for all moisture adjustments. Recoverable Coal Reserves are stated on a ROM moisture basis, as received by the processing plant. Marketable Coal Reserves are stated on a product moisture basis, as sold. |
| *Metallurgical* | • The ROM coal produced at Takitimu is crushed and screened on site. A process recovery of |

| Criteria | Commentary |
|---|---|
| *factors or assumptions* | 95% is used based on a processing reconciliation study.<br><br>• Product coal specifications include ash, sulphur, moisture and calorific value. |
| *Environmental* | • All environmental approvals are currently in place to operate the Coaldale section of the mine<br><br>• BRL is in the process of seeking approvals to expand the current operations into the Black Diamond area.<br><br>• Waste rock characterisation results show that the material is non-acid or metal producing. As such, it does not require special placement requirements or procedures in the dumps. |
| *Infrastructure* | • All necessary infrastructure is in place and operational for the current operation. |
| *Costs* | • All infrastructure is in place at Takitimu. The primary ongoing capital requirements are for equipment replacement and this is included in the economic model.<br><br>• All operating costs were based on the 2017 Takitimu 5 year budget estimates provided by BRL and include allowances for royalties, commissions, mining costs, train loading and administration.<br><br>• Prices are at the mine gate. Customers pay for transport.<br><br>• Product specifications and penalties for failure to meet specifications were provided by BRL. |
| *Revenue factors* | • Prices are at the mine gate. Customers pay for transport.<br><br>• Product specifications and penalties for failure to meet specifications were provided by BRL. |
| *Market assessment* | • Long term supply contracts are in place. |
| *Economic* | • No NPV analysis was completed as it is an operating mine. For JORC Reserves reporting purposes, detailed mine design and schedules are generated. This work includes identifying the mining sequence and equipment requirements.<br><br>• BRL generates detailed cash flow schedules and identifies incremental and sustaining capital requirements. |
| *Social* | • BRL has key stakeholder agreements in place. |
| *Other* | • All mining projects operate in an environment of geological uncertainty. The Competent Person is not aware of any other potential factors, legal, marketing or otherwise, that could affect the operation's viability.<br><br>• The Competent Person understands that the pit shells the Statement is based on extend into EP51260 in the Black Diamond area. Updating of approvals is an ongoing process and it is reasonably expected that any modifications to existing agreements or additional agreements that may be required can be obtained in a timely manner. |
| *Classification* | • Classification of Ore Reserves has been derived by considering the Measured and Indicated Resources and the level of mine planning.<br><br>• For the Takitimu operation, Measured Coal Resources are classified as Proved Coal Reserves and Indicated Resources classified as Probable Coal Reserves, as the mine is currently operating and the level of mine planning is considered adequate.<br><br>• The Inferred Coal Resources have been excluded from the Reserve estimates. |

| Criteria | Commentary |
|---|---|
| *Audits or reviews* | • Internal peer review and reconciliation by BRL of the Reserves estimates has been completed. |
| *Discussion of relative accuracy/ confidence* | • Periodically, the ROM coal production is reconciled against depletion of the mining model. To date, more coal has been produced than modelled from the same areas.<br><br>• Accuracy and confidence of modifying factors are generally consistent with the current operation. |

# Appendix
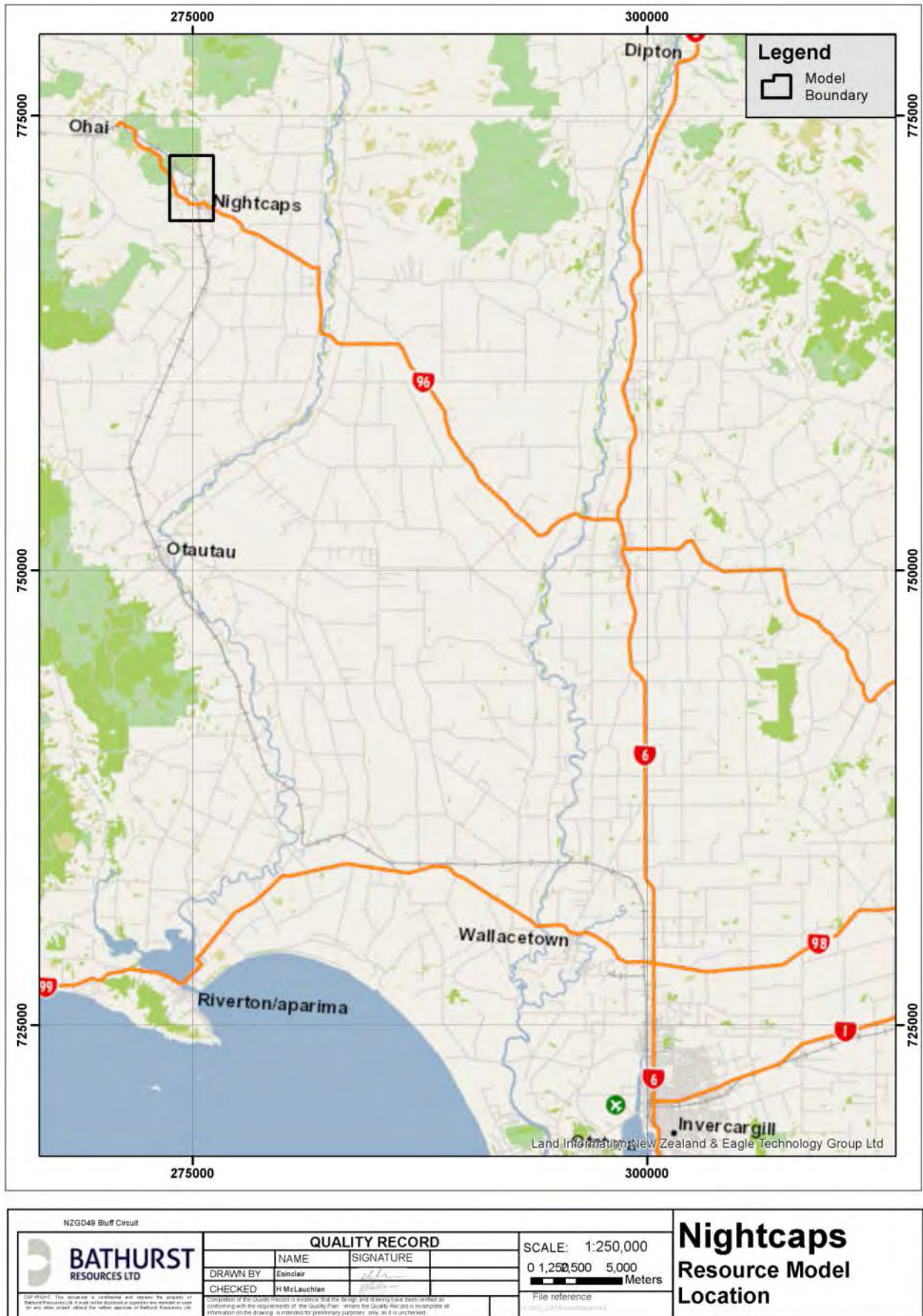


**Figure 8  Location of resource**
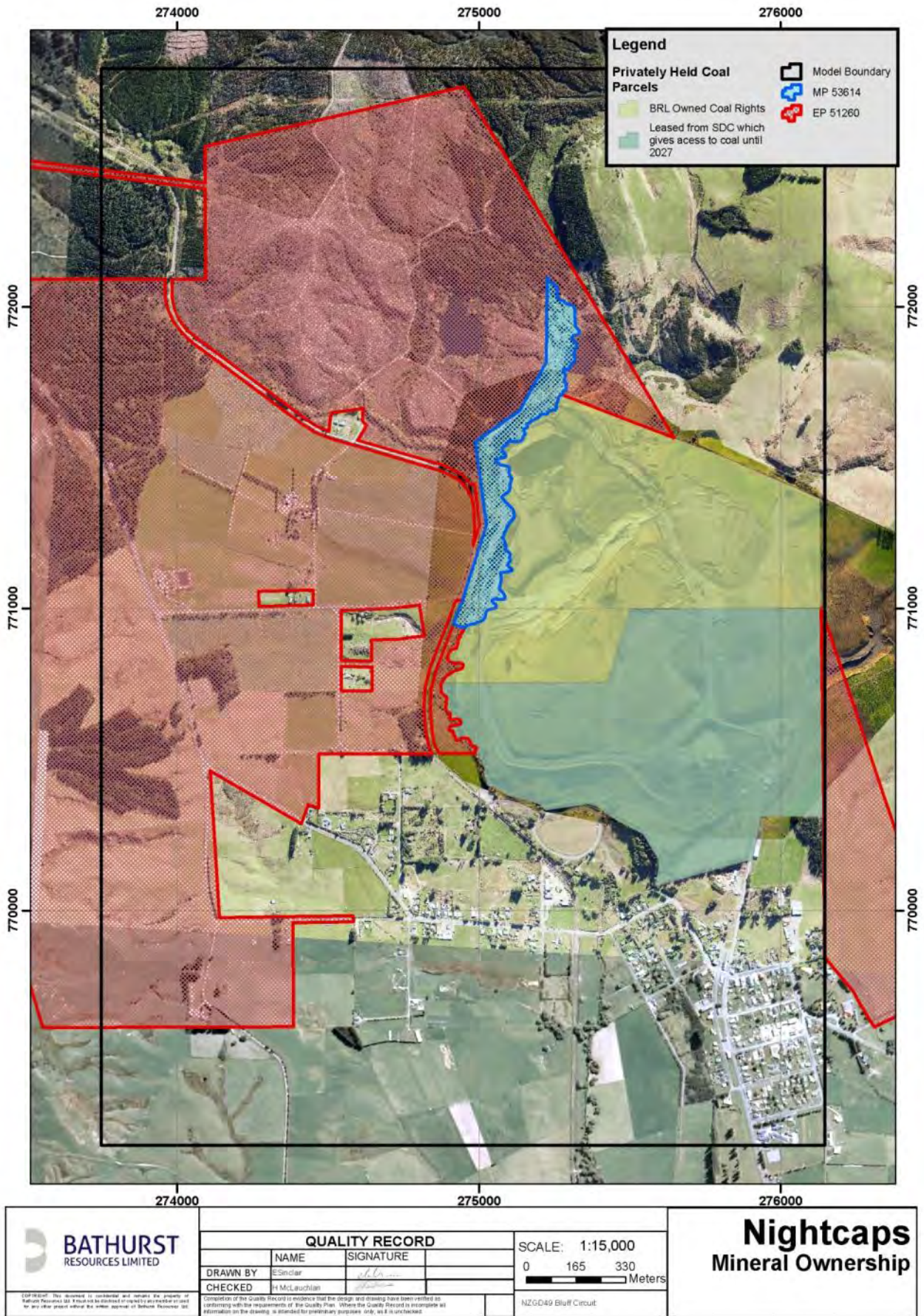
**Figure 9 Land areas that BRL holds coal ownership rights.**
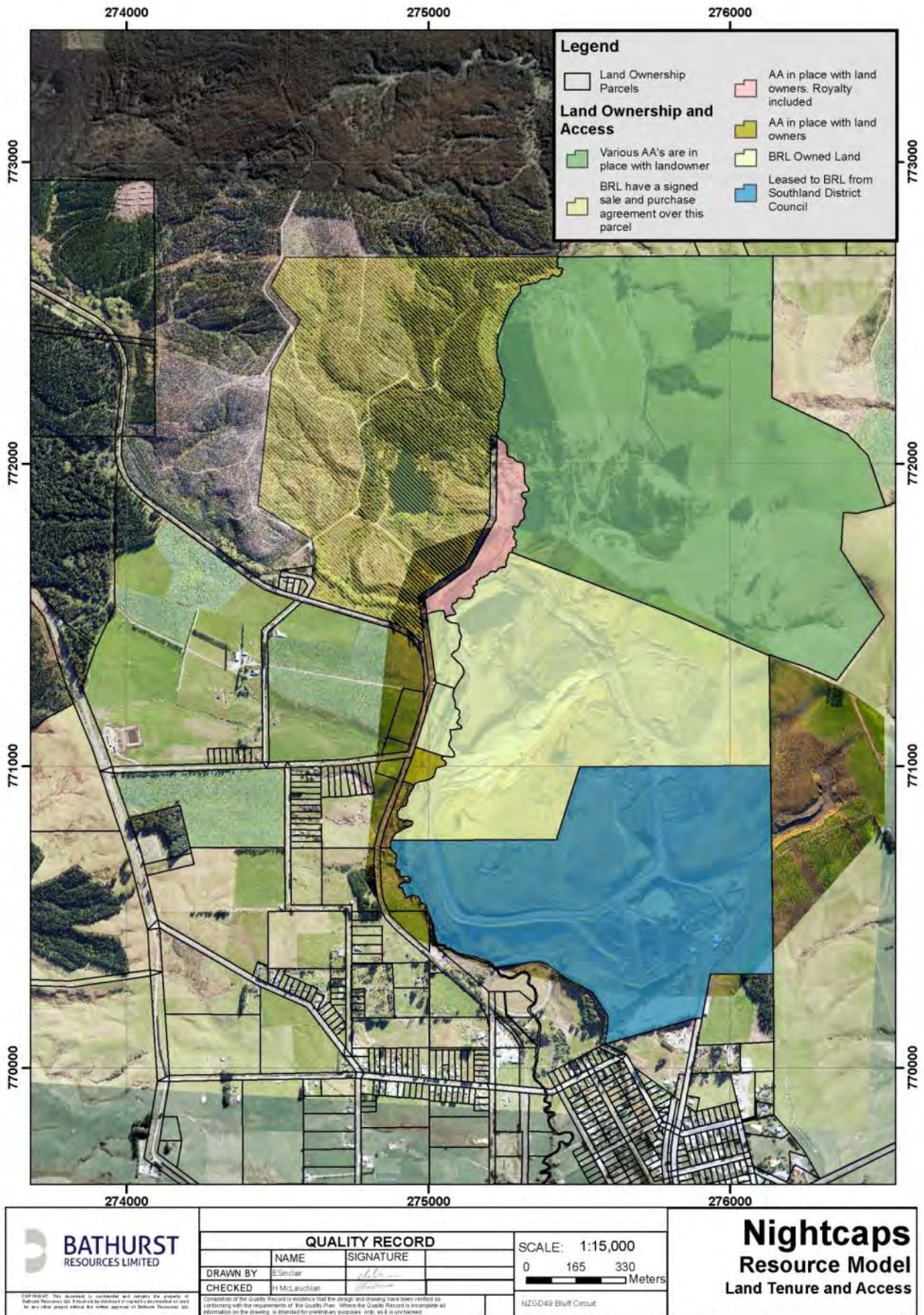
**Figure 10 Access arrangement and land ownership status of land parcels within the project areas.**

**Figure 11 Three regions within the Resource Model**

**Figure 12  Location of drilling and other sampling within the  Resource Area**

**Figure 13  Location of historic mine workings and areas of low confidence.**
**Note: Recent opencast mined areas are not shown. Extent of Coaldale pit is shown by aerial photo from end June 2016.**
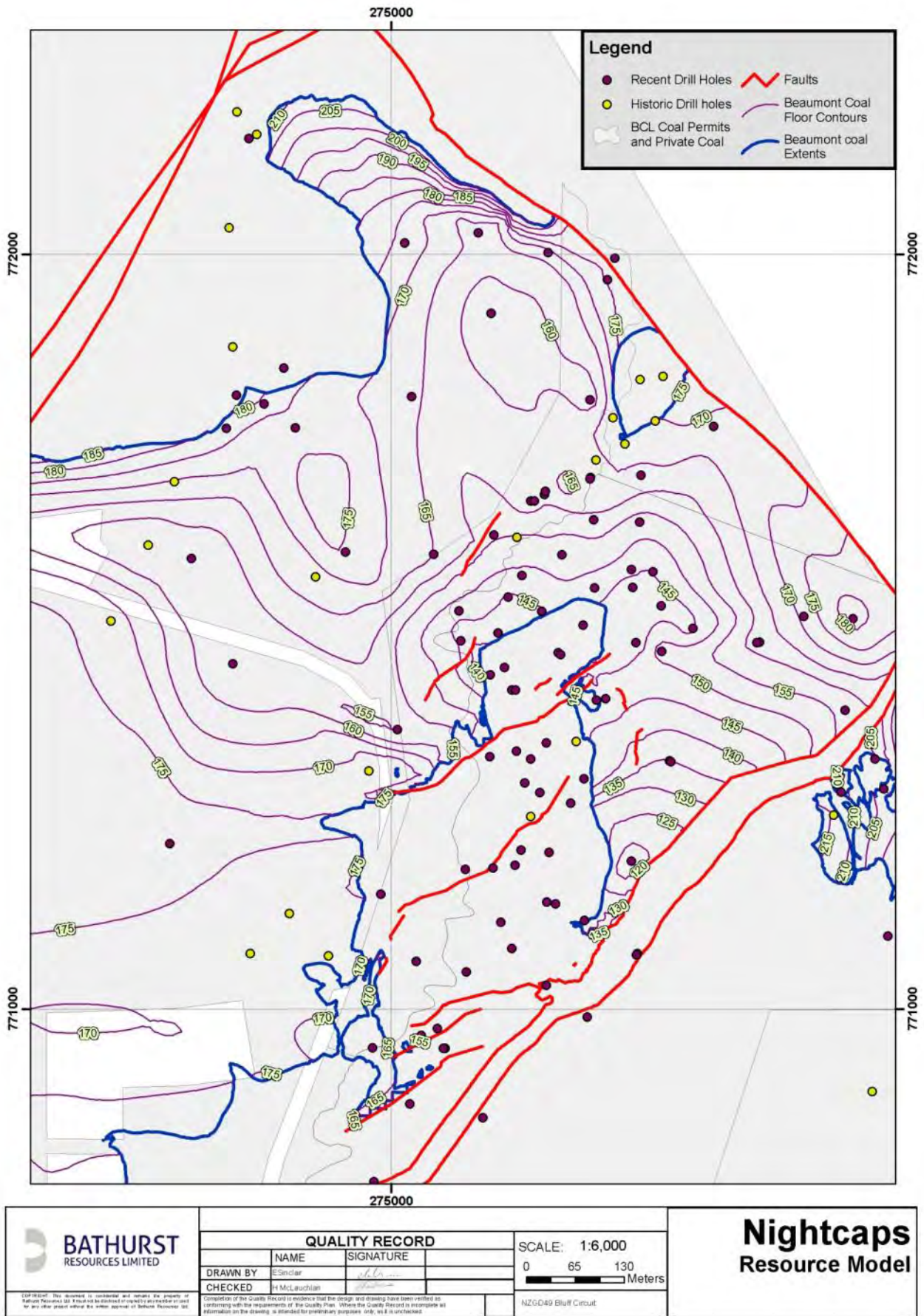
**Figure 14  Beaumont Formation coal floor contours**
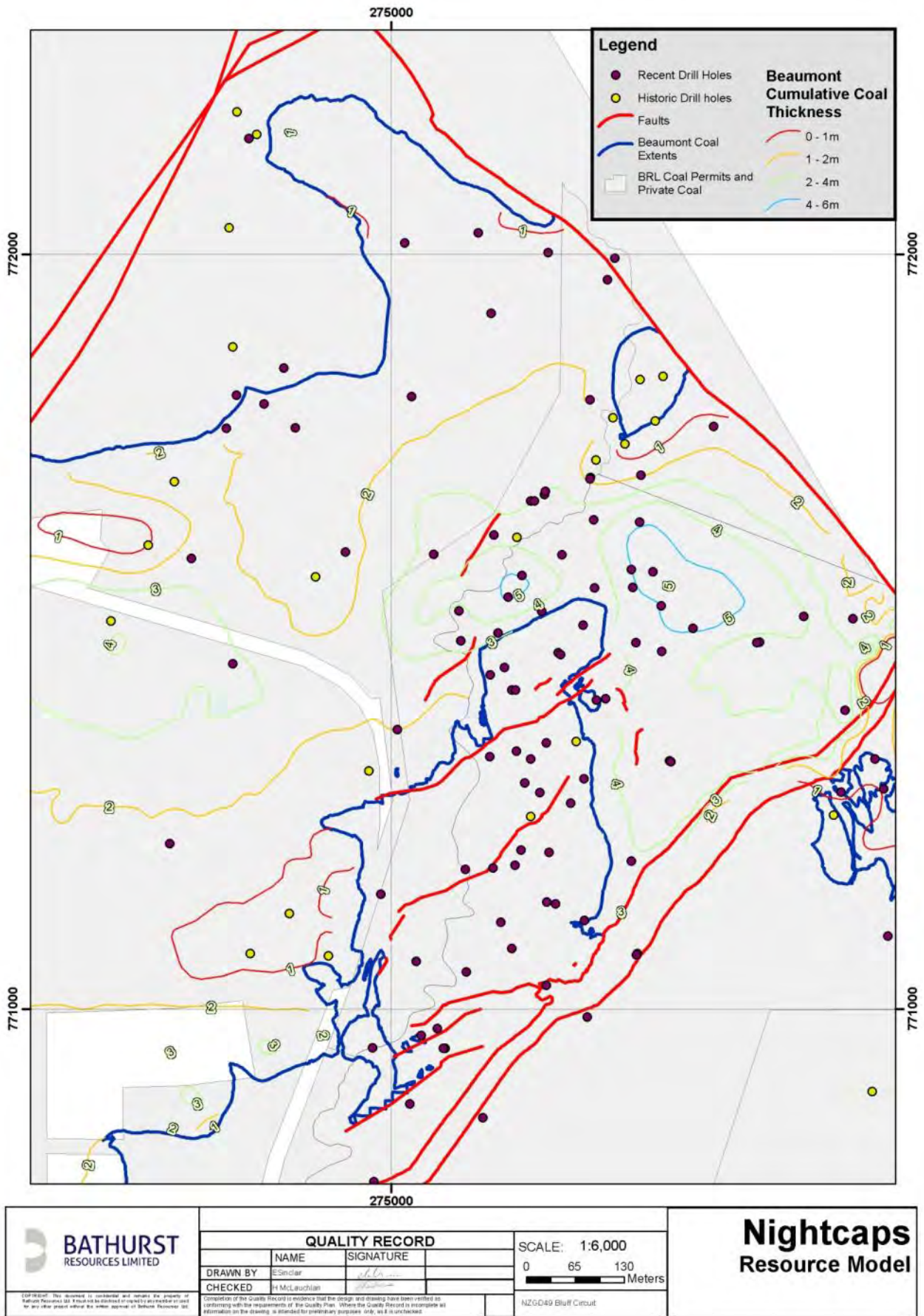
**Figure 15 Beaumont Formation full seam cumulative thickness isopachs**
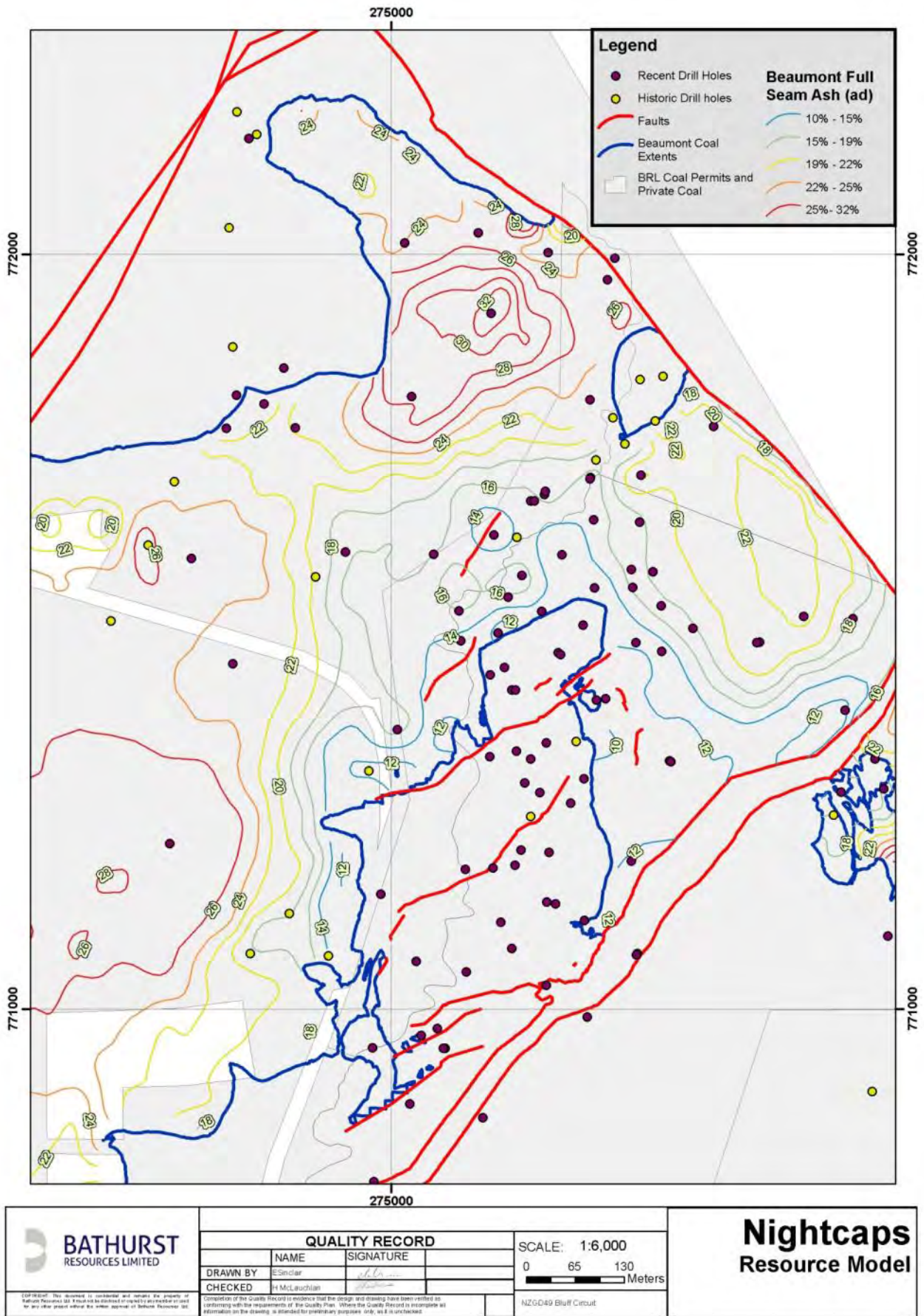
**Figure 16 Beaumont Formation full seam ash isopachs**
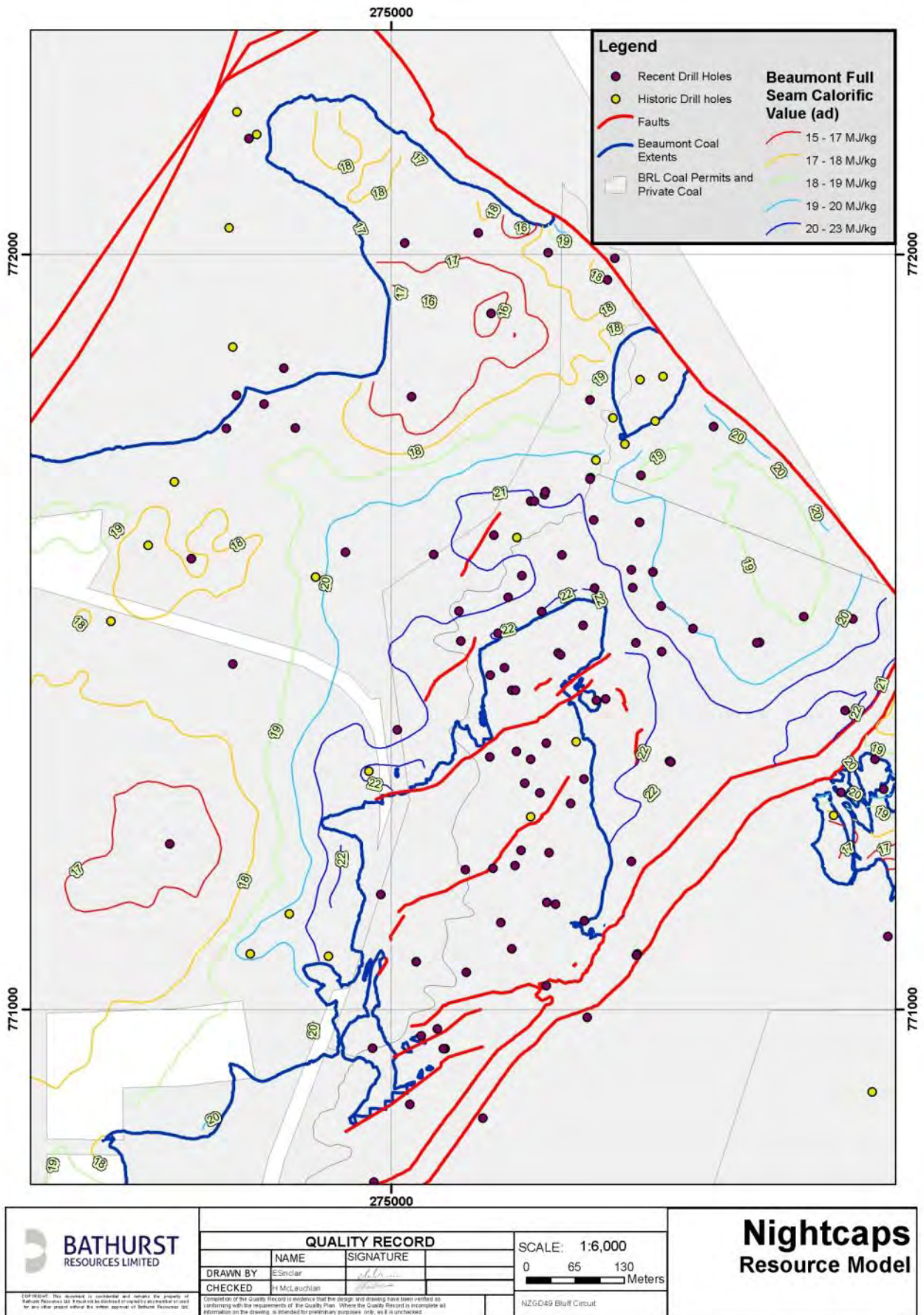
**Figure 17  Beaumont Formation full seam calorific value isopachs**
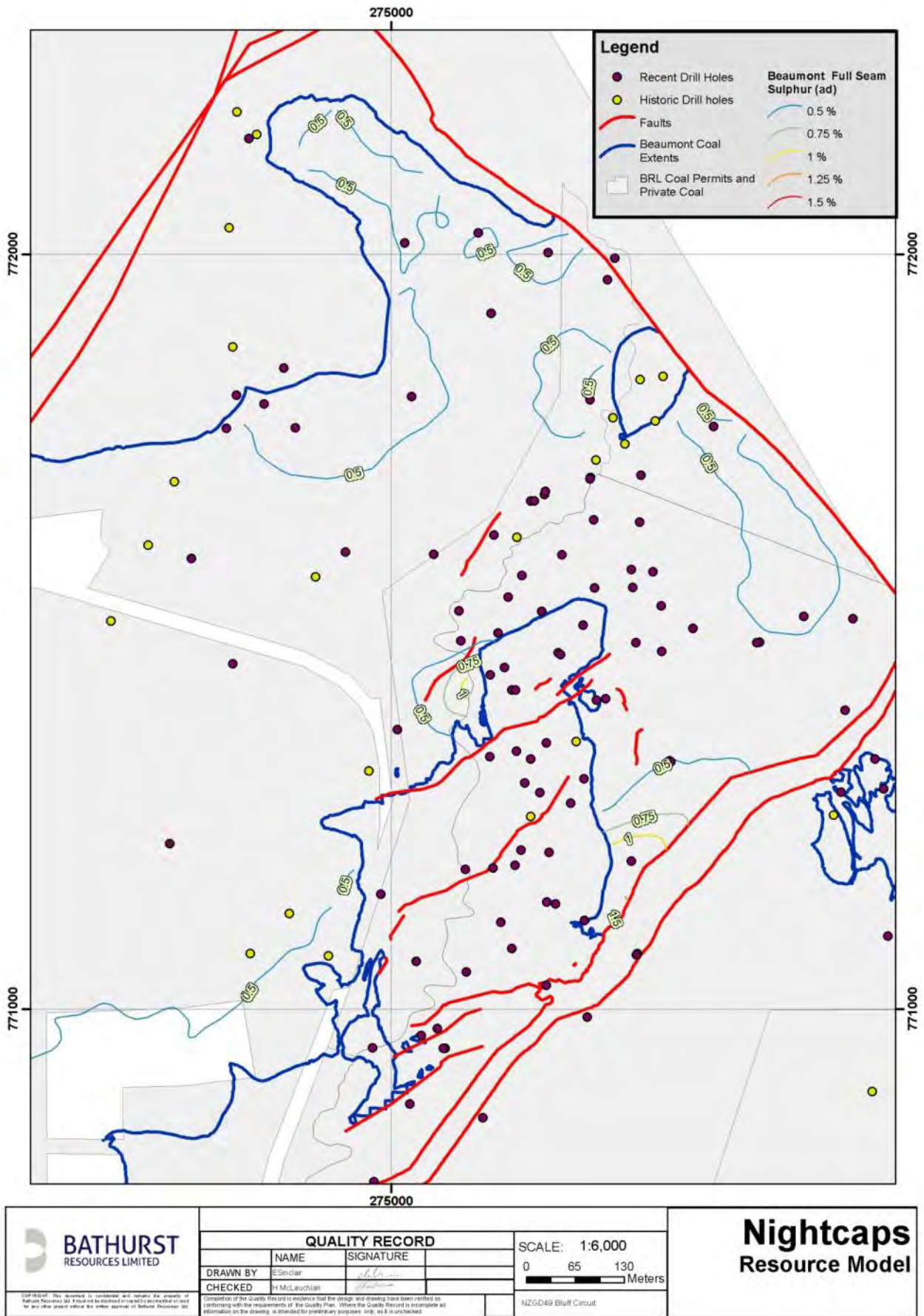
**Figure 18  Beaumont Formation full seam sulphur isopachs**
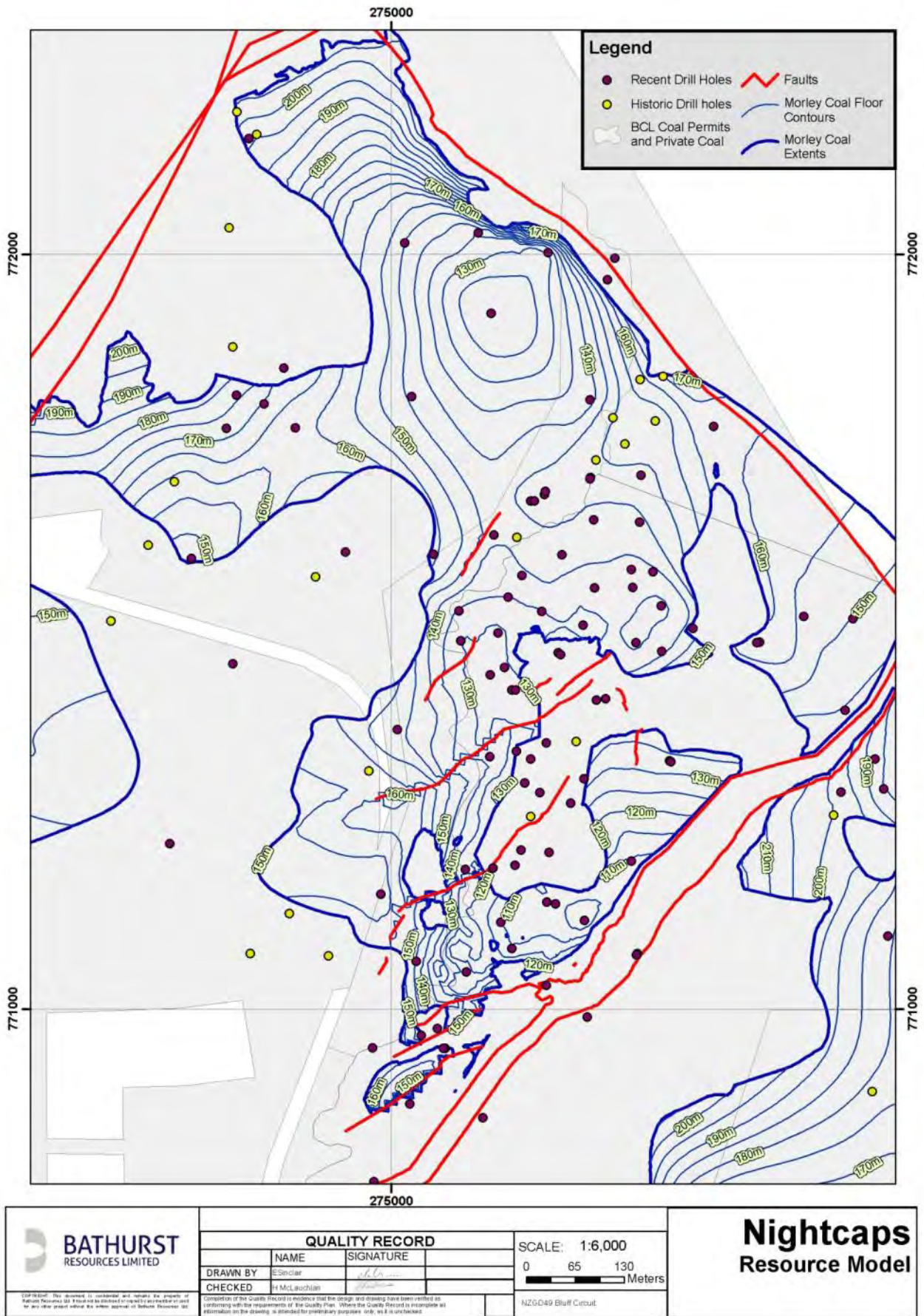
**Figure 19 Morley Formation coal floor contours**
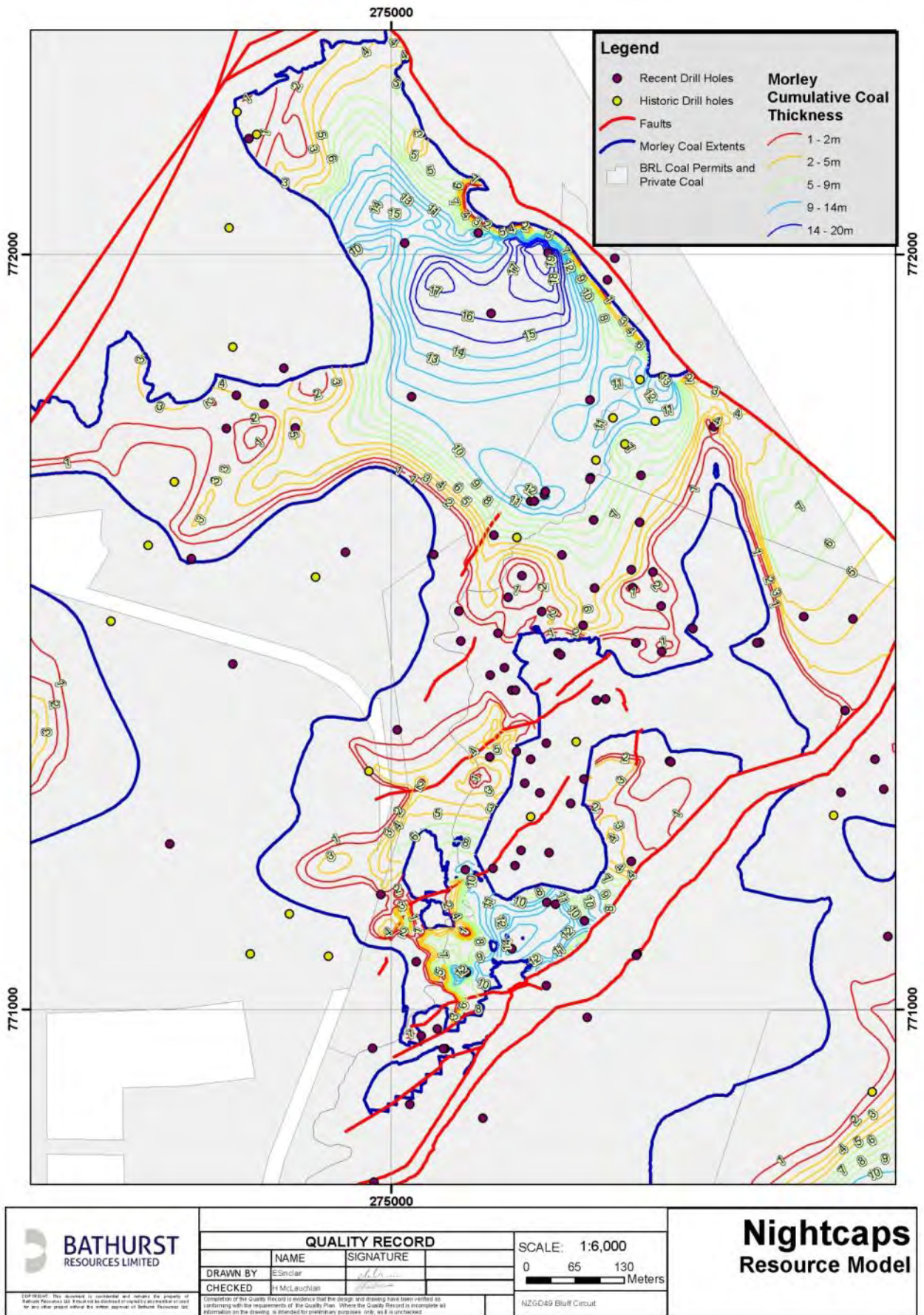
**Figure 20  Morley Formation full seam cumulative coal thickness isopachs**
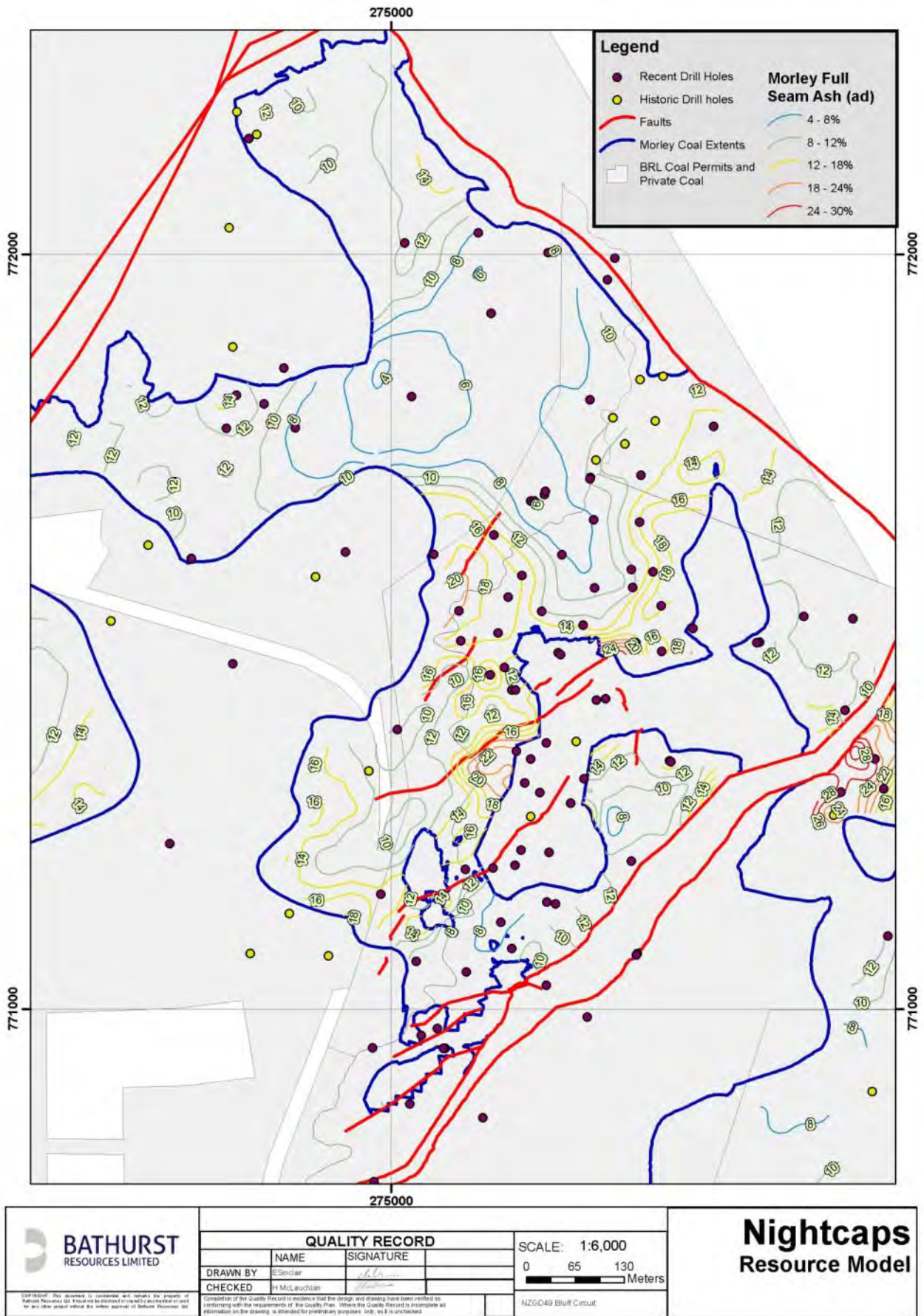
**Figure 21  Morley Formation full seam ash isopachs**
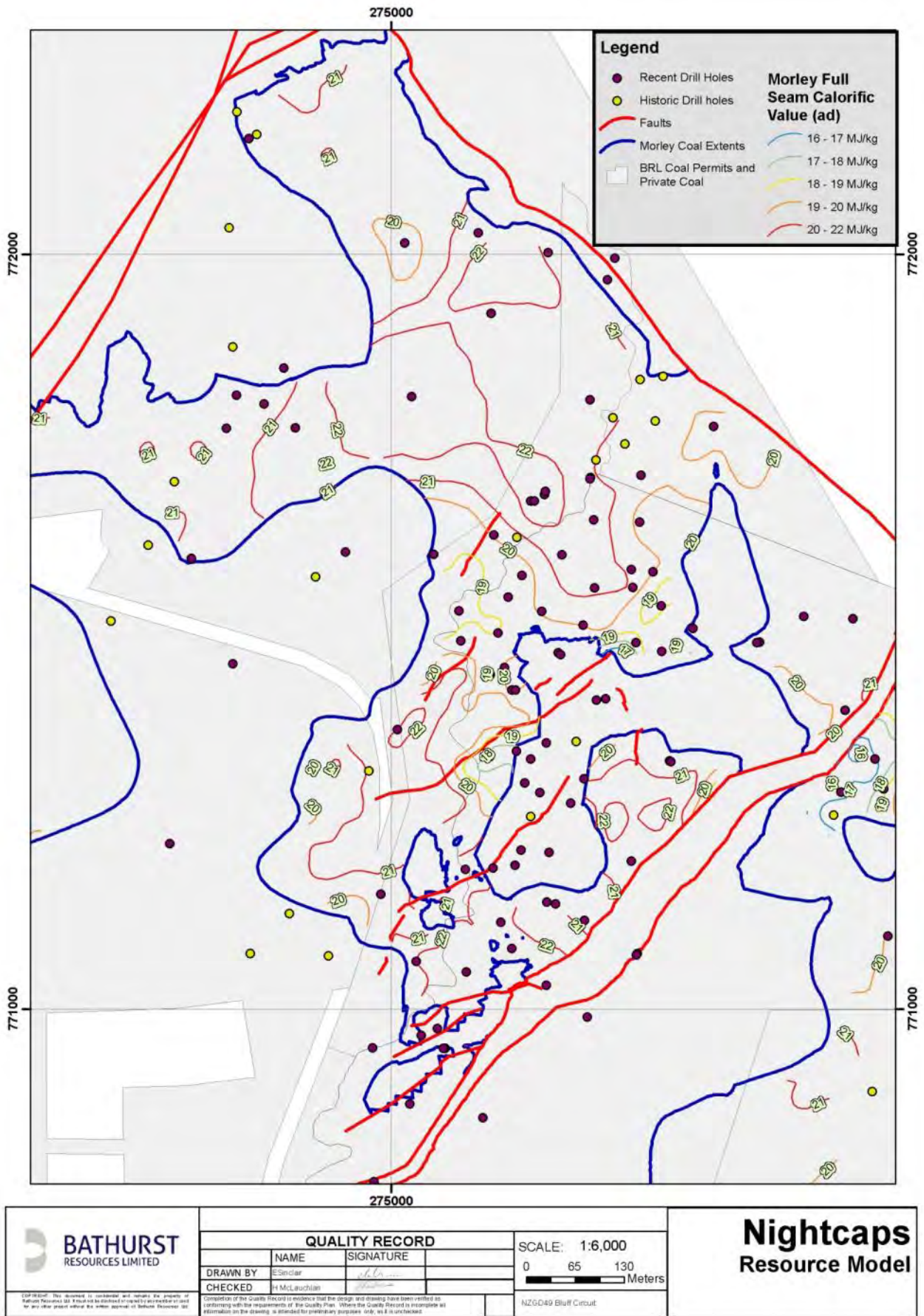
**Figure 22 Morley Formation full seam calorific value isopachs**
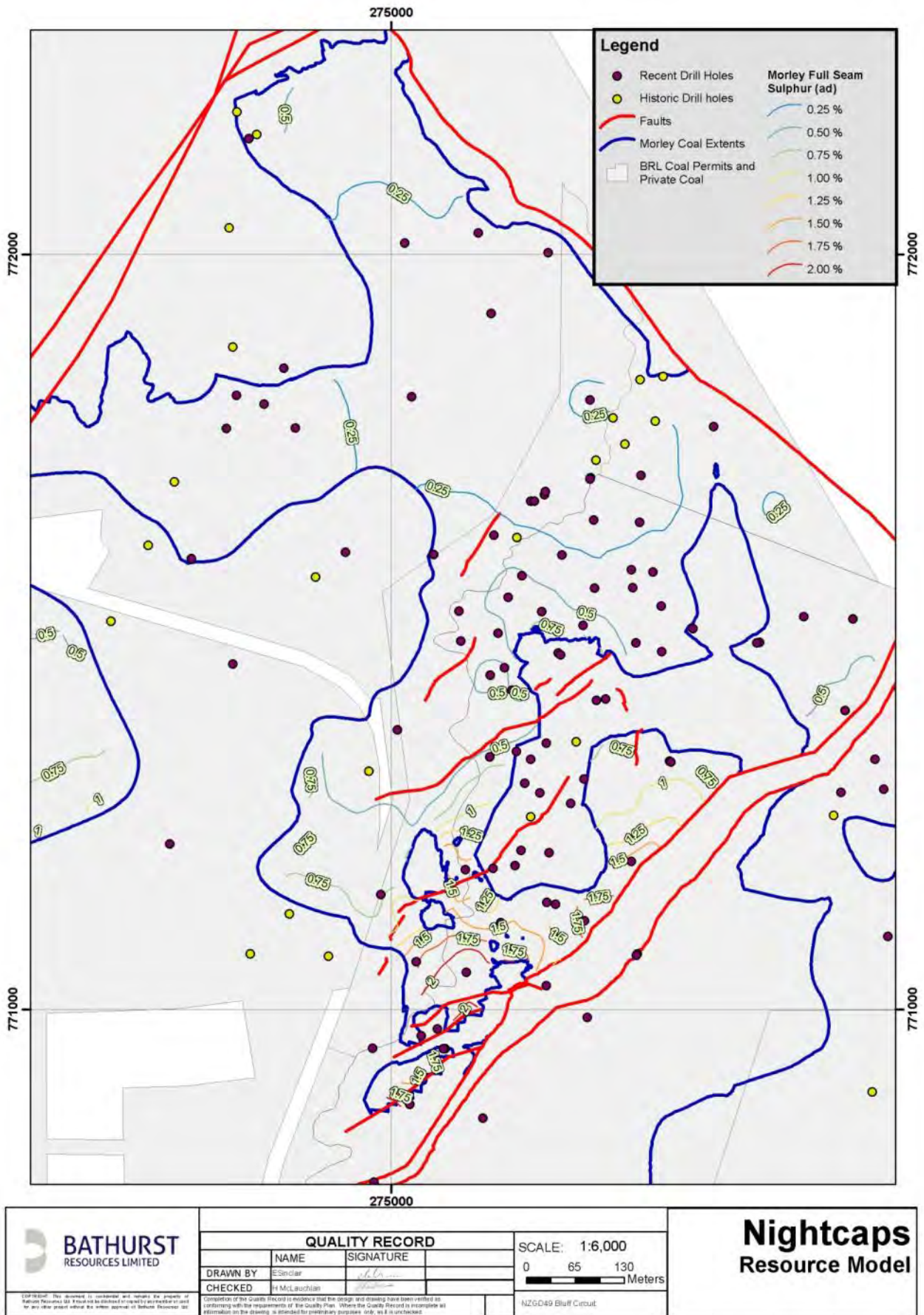
**Figure 23  Morley Formation full seam sulphur isopachs**
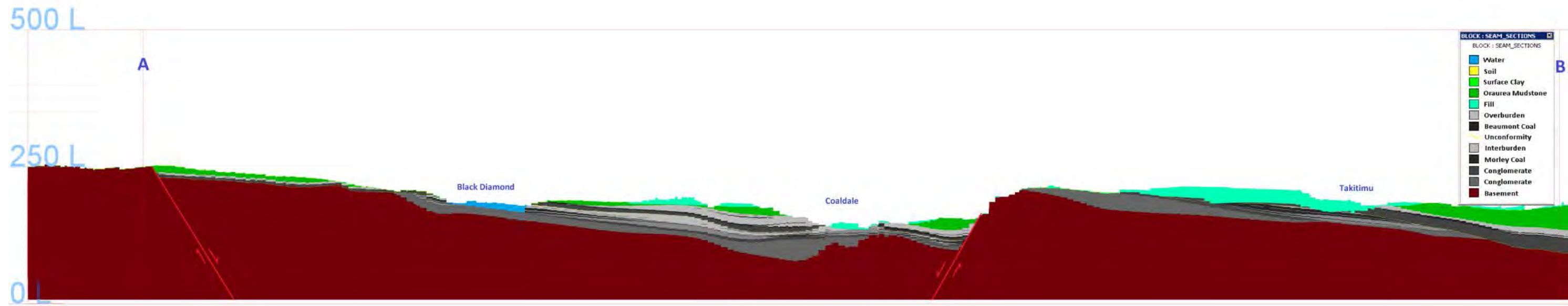
Figure 24 Section view through the deposit. The Fern fault and Trig E faults are shown.



Figure 25 Plan view showing the section through A-B. Model boundary is shown in blue.

# JORC Code, 2012 Edition – Table 1 Report for the Canterbury Project 2016

## Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

| Criteria | Commentary |
|---|---|
| *Sampling techniques* | • Malvern Hills, near Coalgate in Canterbury is a historic mining district, with recorded coal production from over 77 mines since 1872. Some historic exploration data of varying quality is available for parts of the area.<br>• Modern exploration data includes that acquired by BRL during due diligence undertaken in 2013. This data includes<br>   o 15 PQ/HQ Triple Tube core (TTC) drill holes<br>   o 45 outcrop trenches and mapped seam intersections.<br>• Recent drilling has aimed to infill areas around zones of historic workings that are lacking quality data, and to test reliability of historic data. Drilling has been concentrated on a few key areas primarily due to ease of access and prospects for development.<br>• The Bathurst Resources Limited (BRL) target is to geophysically log every drill hole where down hole conditions and operational constraints allowed. Field Tech Services Ltd was contracted for down hole geophysical services, utilising a natural gamma tool.<br>• Natural gamma was usually run through a pvc standpipe installed in each hole after completion, or through the in-situ drill string. Natural gamma produces a very reliable trace for use in seam correlation and depth adjustment due to relatively abundant clays in the Broken River Formation coal measures.<br>• Down hole geophysics data was essential to correlate coal seams, to confirm depths and thickness of coal seams and to validate drillers' logs. Geophysics was also used to accurately calculate recovery rates of coal.<br>• Coal sampling was based on the BRL coal sampling procedures. Coal quality ply samples have been selected on all coal logged by a geologist where the geologist had 95% confidence that the ash will fall below 50%. Material with an estimated ash over 50% was not sampled unless the material was a sandstone parting of < 0.1m in thickness within a coal seam whereby it would be included within a larger ply sample.<br>• Outcrop trench and channel samples provide a large proportion of the sample dataset. Coal seam thickness and partings between seams were measured either vertically or as a true thickness. Trench data is entered into the drilling database using azimuth and dip usually orthogonal to seam dip.<br>• Outcrop coal samples were collected as channel samples through the coal seams.<br>• All analytical data has been assessed and verified before inclusion into the resource model.<br>• No deep holes >120m have been drilled in the project area and therefore no down dip information of the deposit is available.<br>• Due to the coal seam dip no single drill hole has been drilled that intersects all of the coal seams in the stratigraphic sequence. |
| *Drilling techniques* | • BRL managed exploration and drilling campaigns have utilised the following drilling methods:<br>   o Full PQ Triple Tube Core (TTC) .In one case overlying strata was open- holed through.<br>   o Full HQ Triple Tube Core.<br>   o PQ reducing to HQ Triple Tube Core where necessary<br>   o Trenches excavated using 20T and 30T excavators<br>   o Trench/Channel samples taken within active mining areas<br>• Historic exploration and drilling techniques include:<br>   o Air circulation blade and hammer<br>   o Reverse circulation blade and hammer<br>   o Air core<br>   o Rotary wash<br>   o Trenches excavated using a 20T excavator and by hand methods<br>• Exploration drill holes have been drilled at a range of inclinations from vertical to 45°. Drill core from angled holes was not orientated. |
| *Drill sample* | • Core recovery was measured as the length of core recovered divided by the length of |

| Criteria | Commentary |
|---|---|
| *recovery* | drillers run and noted by the core logging geologist. If recovery of coal intersections dropped below 90% the drill hole may have required a redrill (no redrills have yet been required). Drillers were paid an incentive if coal recovery was above 90% for holes drilled prior to 2015.<br>• Recovery of coal seams in the Canterbury deposit has been very good due to the strong nature of the coal with average coal recovery at 94.6%. Downhole Gamma geophysical data was used to confirm coal recoveries.<br>• Average total core recovery over the recent drilling campaigns in Canterbury was 86.5%, however, when broken down, it showed that overlying soil, loess and quaternary gravel recovery was 61.7% while coal measure core was recovered at a rate of 91.7%.<br>• Where small intervals of coal were lost and where geophysics indicated strongly that coal was lost, ash values were estimated using the results of overlying and underlying ply samples and the relative response of natural gamma trace.<br>• Sample recovery has been deemed not applicable to trench and channel sampling. |
| *Logging* | • BRL has developed a standardised core logging procedure and all core logging completed by BRL has followed this procedure.<br>• All modern drill core has been geologically and geotechnically logged by geologists under the supervision and guidance of experienced exploration geologists.<br>• As much data as practicable has been logged and recorded including geotechnical and rock strength data.<br>• All drill core was photographed prior to sampling. Depth metre marks and ply intervals are noted on core in each photograph.<br>• Down-hole geophysical logs were used to aid core logging. |
| *Sub-sampling techniques and sample preparation* | • For all exploration data acquired by BRL, an in-house detailed sampling procedure was used. Sampling and sample preparation are consistent with international coal sampling methodology.<br>• Drill core ply samples included all coal recovered for the interval of the sample. Core was not cut or halved. Ply sample intervals were generally 0.5m unless dictated by thin split or parting thickness. Coal sample size is considered adequate to be representative of the coal seam quality.<br>• All drilling by BRL has been completed using triple tube cored holes. No chip or RC samples were taken in these campaigns.<br>• For historical data, sample preparation processes are unknown. However no historical drill hole coal quality results are used in the resource estimation.<br>• Trench samples were taken representatively from excavated and cleaned outcrop, preventing sampling of weathered coal and other contamination of the sample. Sample intervals were measured vertically, orthogonal to the seam or at the angle of the trench plunge and were generally 0.5m or less. No field sample duplicates have yet been taken or analysed. Sample sizes generally aim to be at least 1kg of coal per 0.5m sampled.<br>• Most assay samples were prepared on site however some were completed at the core repository after transport from drill site in core boxes. Samples were taken as soon as practicable and stored in a chiller until transported to the coal quality laboratory. |
| *Quality of assay data and laboratory tests* | • All coal quality testing completed for BRL has been carried out by accredited laboratory SGS New Zealand Limited (SGS) .<br>• SGS have used the following standards for their assay test work:<br>    o Proximate Analysis is carried out to the ASTM 7582 standard<br>    o Ash has also used the standard ISO 1171<br>    o Volatile matter has also used the standard ISO 562<br>    o Inherent moisture has also used the ISO 5068<br>    o Total sulphur analysis is carried out to the ASTM 4239 standard<br>    o Crucible swell tests are completed using the ISO 501 standard<br>    o Calorific value results are obtained using the ISO 1928 standard.<br>    o Loss on drying data is completed using the ISO 13909-4 standard.<br>    o Relative Density is calculated using the standard AS 1038.21.1.1<br>• BRL has completed a total of 24 full seam composite samples. Composite samples have been tested using the following standards: |

| Criteria | Commentary | |
|---|---|---|
| | **Test Work** | **Standard Followed** |
| | Loss on air drying | (ISO 13909-4) |
| | Inherent Moisture | (ASTM D 7582 mod) |
| | Ash | (ASTM D 7582 mod) |
| | Volatile Matter | (ASTM D 7582 mod) |
| | Fixed Carbon | by difference |
| | Sulphur | (ASTM D 4239) |
| | Swelling Index | (ISO 501) |
| | Calorific Value | (ISO 1928) |
| | Mean Maximum Reflectance All Vitrinite (RoMax) | Laboratory Standard |
| | Chlorine in Coal | (ASTM D4208) |
| | Hardgrove Grindability Index | (ISO 5074) |
| | GIESELER PLASTOMETER | (ASTM D 2639) |
| | AUDIBERT ARNU DILATOMETER | (ISO 349) |
| | FORMS OF SULPHUR | (AS 1038 Part 11) |
| | ASH FUSION TEMPERATURES | (ISO 540) |
| | ASH CONSTITUENTS (XRF) | (ASTM D 4326) |
| | Ultimate Analysis | Laboratory Standard |

- All analysis was undertaken and reported on an air dried basis unless stated otherwise.

| Criteria | Commentary |
|---|---|
| *Verification of sampling and assaying* | - Sample assay results have been cross referenced and compared against lithology logs and downhole geophysics data. Results are also inspected by experienced geologists and compared with expected values utilising known coal quality relationships for the Canterbury coal field.<br>- Anomalous assay results were investigated, and where necessary the laboratory was contacted and a retest undertaken from sample residue.<br>- No twinned holes have been drilled at the project, and no field duplicate trench samples have been taken.<br>- Laboratory data is imported directly into an Acquire database with no manual data entry at either the SGS laboratory or at BRL.<br>- Assay results files are securely stored on a backup server, once validated, and drill hole information is 'locked' in an acquire database to ensure the data is not inadvertently compromised.<br>- BRL commissioned a series of duplicate samples to be completed by CRL Energy Limited.(CRL) These samples have repeated tests performed by SGS on a subset of ply samples selected at random. Results of the duplicate testing showed an average variation of 1.2% of the value for each quality showing good analytical precision. |
| *Location of data points* | - Modern drill hole positions have been surveyed using Trimble RTK survey equipment.<br>- Historic mine plans have been georeferenced by locating and surveying historic survey marks, and mine portals drawn on mine plans. Some surveyed mine plans are available from registered surveyors and engineers and these have been georeferenced using a standard coordinate system.<br>- Some historic mine plans are poorly constrained spatially and a large variance from the current georeferenced images is possible.<br>- New Zealand Trans Mercator 2000 Projection (NZTM) is used by BRL for the Canterbury project area. NZTM is considered a standard coordinate system for general mapping within New Zealand. Historic data has been converted from various local circuits and map grids using NZ standard cadastral conversions.<br>- A LiDAR survey was carried out over the Canterbury area in January 2013. This LiDAR data provides very accurate topographic data used in the model. Contractors specifications state that for the choice of sensor and operating settings used for this project the LiDAR sensor manufacturer's specification states 0.15m (1-sigma) horizontal accuracy and 0.1m (1-sigma) as the open ground elevation accuracy.<br>- Surveyed elevations of drill hole collars are validated against the LiDAR topography and |

| Criteria | Commentary |
|---|---|
| | ortho corrected aerial photography. Historic hole collar elevations have been compared to the LiDAR surface and while most are within 1m to 2m of the surface, there is however a small number of historic holes with a large discrepancy in the RL of the collar and the LiDAR surface which may be due to survey errors, coordinate system conversion errors, or earthworks/mining. |
| *Data spacing and distribution* | • Drill hole spacing in Canterbury is not homogenous. Recent exploration and drilling has targeted potential pit extension areas to the south and west of the actively mined area. Historic exploration data focusses on the current open pit and further to the north and south of the current operation.<br>• The exploration work has been concentrated along strike of the steeply dipping coal measure sequence and therefore produces a very linear dataset.<br>• Drill holes and trench sample locations are unable to be spaced equally or on a grid pattern due to the steep nature of the deposit and limitation of site access. Sample locations are often located to confirm specific matters such as economic pit shell limits or coal quality concerns.<br>• Primary sample spacing has not been estimated over the deposit. There are 23 coal seam packages in the deposit and only a subset of these seams are intersected by each drill hole or trench, therefore the average sample spacing for each individual seam in the deposit varies.<br>• Drill hole spacing is not the only measurement used by BRL to establish the degree of resource uncertainty and therefore the resource classification. BRL uses a multivariate approach to resource classification, whereby sample spacing within each daughter seam provides the primary evidence of continuity used to classify that daughter seam.<br>• The current drill hole spacing is deemed sufficient for coal seam correlation purposes within targeted areas, However due to the lensoidal nature of the coal seams within the Broken River Formation some coal seam correlations northeast of the modern drilling and mapping data may be incorrect.<br>• Geostatistics of the Canterbury dataset has been examined but variography results for many seams were poor due to the uneven distribution of drill holes with coal qualities combined with the large number of seams and structural complexity within the deposit.<br>• The samples database is composited to full daughter seam thickness prior to coal quality grid estimation. |
| *Orientation of data in relation to geological structure* | • Drilling carried out by BRL has been orientated to intersect orthogonal to the general stratigraphic strike-dip plane of the deposit. Structure dip ranges from 20° in the south to 50° north of the current pit.<br>• Drill hole inclination was recorded at the surface using a inclinometer and compass. Drill hole deviation has not been verified by down hole survey tools, but any deviation from design is not expected to have a material effect on geological understanding of the deposit as the average drill hole depth in the dataset is 52m with the deepest coal intersection of 96m downhole.  At a depth of 60m an overall deviation of 1° would produce a horizontal deviation of 1m at the end of hole and a negligible thickness deviation for seams intersected at that depth.<br>• Angled drilling is considered the most suitable drilling method for the Canterbury deposit to provide unbiased data.<br>• Trenches are usually orientated perpendicular to the strike of bedding. Surface intersections are surveyed and are then adjusted to simulate a drill hole. Trench data is logged in such a way as to simulate a drill hole drilled from the collar point of the trench. |
| *Sample security* | • Stringent sample preparation and handling procedures have been followed by BRL.<br>• Ply samples are taken and recorded from drill core, bagged and placed within a locked chiller prior to being dispatched for analysis.<br>• Samples are normally hand delivered to SGS by BRL staff, thus removing the potential for third parties to tamper with the samples.<br>• It is not considered likely that individual coal samples face a risk of theft or sabotage as coal is a bulk commodity with little value for small volumes of coal from drill core. |
| *Audits or reviews* | • BRL has reviewed the geological data available and considers the data used to produce the resource model is reliable and suitable for the purposes of generating a resource estimate to the extent that the resource has been classified.<br>• Results of a duplicate sample testing program comparing SGS and CRL assay results |

| Criteria | Commentary |
|---|---|
| | shows little analytical error or bias between laboratories. |
| | • The Competent Person undertakes audits of the sample collection and analysis. |

## Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

| Criteria | Commentary |
|---|---|
| *Mineral tenement and land tenure status* | • Coal ownership is complex throughout the Canterbury coal field.<br>• The majority of potential coal resources within the Malvern Hills coal field, north of the Selwyn River, are classified as coal that is privately owned with coal rights being attached to the land title.<br>• The ownership of coal rights is separate from the land ownership in a number of land parcels surrounding the Canterbury mine. Blocks to the Northeast of the current mining operation are held by Nimmo Collieries and by Charles Dean. Canterbury has agreements in place to access this coal.<br>• Royalty agreements in place for this private coal are based on the mine gate value of coal sold. Mine gate value is defined as the price received at point of sale minus ex-mine costs such as freight, handling and commissions.<br>• Some Crown coal does exist and BRL has 100% ownership in the following coal permits: |

| Permit[1] | Operation | Expiry |
|---|---|---|
| **Mining Permit 41372** | Malvern Hills | 11/12/2025 |

[1]  Coal within MP41372 is owned by the Crown and Wakaepa Farms in a 50/50 split.

| | • BRL holds land access agreements over all of the areas it currently operates at the Canterbury project and over all areas containing reported resources.<br>• Much of the remainder of land that makes up the Canterbury project is owned by Matariki Forests (formerly the Selwyn Plantation Board). An access arrangement is in place to allow BRL to access through the areas, allow exploration activities and to undertake mining. This agreement expires April 1st 2020.<br>• BRL have not reported any resources for the Canterbury project where land access and/or mineral rights have not been granted. |
|---|---|
| *Exploration done by other parties* | • Historic geological investigations and reports for the Canterbury coal field have been compiled spanning the past 140 years.<br>• All historic data used to develop the resource model has been validated against original source documents by BRL staff. Most historic data was deemed unreliable due to a number of factors; primarily spatial survey data was missing or poor. Unreliable historic data was not included within the resource model dataset.<br>• The historic drilling database includes the following drill holes compiled from the historical data records. |

| Years | Agency | Range of Collar ID | # Holes | Drilling Method | # Holes in structure model | # holes in quality model | Geophysics Available |
|---|---|---|---|---|---|---|---|
| 1919-1921 | Homebush Brick and Coal | HB_Bore_01 - HB_Bore_13 | 13 | Diamond | 0 | 0 | 0 |
| 1921 | Homebush Coal company | Gov_1 - Gov_7 | 7 | Diamond | 0 | 0 | 0 |
| 1944 | Klondyke Colleries | Klondyke_1 - Klondyke_7 | 7 | Diamond | 0 | 0 | 0 |
| <1949 | Deans | DEANS_1 - DEANS_5 | 5 | unknown | 0 | 0 | 0 |
| 1987 | Coal Corp | CoalCorp_1 - CoalCorp_4 | 4 | unknown | 0 | 0 | 0 |
| <1997 | ? | CCL_N1 - CCL_N2 | 2 | unknown | 0 | 0 | 0 |
| 1997 | Yardley | CCL_Y1 - CCL_Y8 | 8 | Rotary air | 3 | 0 | 0 |
| 2002 | CCL | CCL_T1 - CCL_T47 | 47 | Trenching | 9 | 7 | 0 |
| 2006 | CCL | CCL_DB01 - CCL_DB16 | 16 | RC and Air core | 14 | 0 | 0 |

| Criteria | Commentary |
|---|---|
| | • BRL is continuing to source historic plans and reports from a number of data libraries around New Zealand. Historic data will be validated and added to the exploration dataset if it is deemed reliable. |
| *Geology* | • The project is located in the Canterbury coal field, Malvern Hills, New Zealand.<br>• The defined resource is contained within the late Cretaceous to Early Paleocene aged Broken River Formation., formed during the Tertiary transgressive-regressive cycle between the Rangitata and Kaikoura Orogenys.<br>• Overlying the coal measures is the Conway Formation, dominated by micaceous and quartz rich fine sandstones and mudstones indicative of littoral to shallow marine settings.<br>• Pleistocene aged glacial outwash gravels and tills mask underlying stratigraphy over much of the area. Younger river gravels also dominate larger river valleys within the area.<br>• Glacial derived windblown loess deposits mantle much of the area.<br>• Igneous intrusions are present in the Malvern Hills area. Some contact metamorphism of coal measures has been observed with localized rank increases observed in some Canterbury coal samples, however none have been noted in the current resource area.<br>• Generally the project area is structurally simple. Coal seams are not greatly affected by cross cutting faults. Seam dips range between 20° in the south to 50° the north of the current open pit area. In some locations it has been observed that localised slumping has caused overturning of the coal seams. |
| *Drill hole Information* | • No exploration results are being presented in this report, rather this report is focused on advanced projects that have been defined by geological models with associated resource estimates completed.<br>• Due to consistent nature of coal deposits and the bulk nature of the commodity exclusion of this information from this report is considered not to be material to the understanding of the deposit. |
| *Data aggregation methods* | • Exploration drilling results have not been reported.<br>• The maximum ash cut off for building the Canterbury structure model was set at 50%.<br>• Resources have been reported with a block ash cutoff of 25%.<br>• A minimum coal seam vertical thickness cutoff of 0.3m was used to remove thin coal seams from the resource model. |
| *Relationship between mineralisation widths and intercept lengths* | • Exploration drilling results have not been reported.<br>• Coal seams in the project area strike ~060° and dip between 20° and 50° to the south east.<br>• All recent drill holes were drilled at an angle orthogonal to the coal seam structure dip.<br>• Some historic drilling was also inclined to intersect seams at close to 90°. Most historic holes were drilled vertically.<br>• Coal seam thicknesses are reported as apparent thickness down hole. |
| *Diagrams* | • Plans have been attached in the appendix. |
| *Balanced reporting* | • No exploration results are being presented in this report, rather this report is focused on advanced projects that have been defined by geological models with associated resource estimates completed.<br><br>• The exclusion of this information from this report is considered not to be material to the understanding of the deposit. |
| *Other substantive exploration data* | • The resources reported in this report relate to the area in and around an existing operating coal mine.<br>• Geotechnical logs and samples were taken by the geologist during all exploration by BRL. Geotechnical logs identified defect types, angles and character through cored intervals. Geotechnical samples were taken of seam roof, floor and overburden material.<br>• Geochemical characterisation of overburden material for acid base accounting (ABA) purposes has been conducted. These results have been used to construct an ABA model. |
| *Further work* | • Further exploration is planned along strike both to the north and south of the current opencast pit.<br>• Channel sampling of coal seams within the active pit are undertaken periodically. |

# Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

| Criteria | Commentary |
|---|---|
| *Database integrity* | <ul><li>All historic and legacy datasets have been thoroughly validated against original logs and results tables. Where reliability of the data is poor the data is excluded from the modelling process.</li><li>BRL utilizes an Acquire database to store and maintain its geological exploration dataset.</li><li>The Acquire database places explicit controls on certain data fields as they are entered or imported into the database such as overlapping intervals, coincident samples, illegal sample values, standardized look-up tables for logging codes.</li><li>Manual data entry of assay results is not required as results are imported directly from reported laboratory results files.</li></ul> |
| *Site visits* | <ul><li>Hamish McLauchlan (the Competent Person) visits the Canterbury project area on a regular basis.</li></ul> |
| *Geological interpretation* | <ul><li>BRL has confidence in the geological model and the interpretation of the available data. Confidence varies for different areas and this is reflected by the resource classification.</li><li>Down-hole gamma logs are a key tool in correlating the often thin and numerous seam packages between drill holes.</li><li>BRL uses a multivariate approach to resource classification which takes into account a number of variables.</li><li>BRL considers the amount of geological data sufficient to estimate the resource.</li><li>Uncertainty surrounds historic underground mine workings, both in the quality and quantity of coal extracted and which seam was mined, and surveying and spatial location of underground workings. This uncertainty is reflected in the resource classification.</li><li>Quaternary gravel deposits overlie the coal measures unconformably over the southern portion of the project area. Some uncertainty surrounds the depth of erosion and the extent of the quaternary deposits. A conservative approach to modeling this Quaternary erosional surface has been used in the model, and is reflected within the resource status.</li></ul> |
| *Dimensions* | Depth of cover varies from 0m at outcrop to over 200m at the south eastern boundary of the model. The strike length of the deposit is in excess of 4km. |
| *Estimation and modeling techniques* | <ul><li>All available and reliable exploration data has been used to create a geological block model for resource estimation and classification.</li><li>All exploration drilling data is stored in Acquire and exported into a Maptek Vulcan drill hole database.</li><li>Mapping data including coal seam thickness and roof/floor points is stored in Acquire and exported into Vulcan.</li><li>Interpretive data is stored within Vulcan in various layers.</li><li>An horizons definition has been developed and is used in the stratigraphic modeling process.</li><li>Vulcan 9.1.8 was used to build the structure model. Grid spacing is 5m x 5m. This spacing was selected to be 1/5 of the minimum data spacing of a targeted area and to model steeply dipping strata more accurately.</li><li>Vulcan's Hybrid method was used to produce the structure model. This method triangulates a reference surface and then stacks the remaining horizons by adding structure thickness grids. Thickness grids were created using inverse distance. Design data from other horizons was incorporated into the final grid structure.</li><li>The maximum triangle length for the reference surface was set to 800m.</li><li>The maximum search radius for inverse distance was 800m. The inverse distance power was set to 2, with maximum samples set to 6.</li><li>Structure grids were checked and validated before being used to construct the resource block model.</li><li>Vulcan 9.1.8 was used to build the block model. The process was automated using a Lava script.</li><li>The coal structure surfaces, along with LiDAR topography surface, quaternary unconformity, and opencast mined out surfaces were used to build the block model. The block dimensions were constructed at 5m x 5m. Vertical thickness for coal blocks is 0.25m,</li></ul> |

| Criteria | Commentary |
|---|---|
| | whilst overburden blocks have no maximum thickness. The model is rotated at 060° to align with the strike of the coal measure deposits. |
| | • Coal seam existence has been masked by a 0.3m vertical thickness cutoff. No resources are reported for daughter seams of less than 0.3m vertical thickness |
| | • Quality grids for each daughter seam are built using composited samples for each daughter seam using an inverse distance squared function. |
| | • All seams have a maximum search radius of 500m. If a coal block was not estimated during the grade estimation process the blocks were not reported as resources. |
| | • Quality grids for air dried ash, sulphur, volatile matter, and inherent moisture and in-situ moisture were estimated. Calorific value was calculated from ash on a dry basis. |
| | • Geostatistics of the coal quality dataset has been investigated to examine and define the estimation search parameters; however the results have been poor due to the non-normal distribution of the data along strike of the deposit. |
| | • Coal quality grids were built for each daughter seam with the maximum search radius set to 500m. The grids were built using the inverse distance function with a power of 2 and maximum samples of 6. |
| | • Various methods have been used to check the validity of the block estimation. This includes manual inspection of the model, QQ plots of block model qualities vs the coal quality database and other comparison tools. |
| | • Reconciliations of production versus plan were completed quarterly with coal production generally within 5-10% of the modelled coal tonnage. Production data on coal quality was insufficiently recorded to reconcile modelled coal quality. |
| | • Resource tonnages within historic underground workings areas have been discounted by an estimated average extraction rate. The primary underground mining method utilised historically in Malvern Hills area was bord and pillar mining although some minor hydro mining took place at Nimmo's underground operation in the 1970's but production was limited due to a lack of available water. Historic extraction rates vary however the rate used to discount coal tonnages within worked seams in the model is 50% of the original unmined tonnage. |
| Moisture | • Resource tonnages are reported using natural bed moisture, calculated from air dried density, air dried moisture and in-situ moisture using the Preston Sanders equation. |
| Cut-off parameters | • Stratigraphic structure grids have been developed based on a 50% ash cutoff. |
| | • No lower cutoff has been applied. There is an inherent minimum limit to ash samples in modern results due to a laboratory lower detection limit of 0.17% (adb). |
| | • Coal resources were reported down to a seam thickness of 0.25m (one block), however all seams were masked from the model where modelled structure thickness was less than 0.3m thick (vertical) with an ash cutoff of 25%. |
| Mining factors or assumptions | • It is assumed that any future mining operation would have a minimum vertical daughter seam thickness of 0.3m as a minimum mining horizon cutoff. The current opencast operation mines some seam splits that are thinner than this. |
| | • Only coal that falls within an optimized pit shell with revenue factor 1.0 is reported as resources. Costs and revenue parameters used in the pit optimization are based on the 2016 Canterbury budget and include allowances for royalties, commissions, mining costs, coal processing and administration, and basic mining and processing losses. |
| | • No other mining factors such as strip ratios, mining losses and dilutions have been applied when developing the resource model, or reporting resource tonnages. |
| Metallurgical factors or assumptions | • No metallurgical assumptions have been applied in estimating the resource. |
| | • Currently no wash plant is used at the Canterbury operation. The ROM coal produced is processed through a crushing/screening plant where losses are minimal. |
| Environmental factors or assumptions | • Studies for ABA characterisation of overburden, and boron leaching studies have been completed. It is not expected that these will prevent eventual economic extraction of the resource |
| | • No other environmental assumptions have been applied in developing the resource model. |
| | • All environmental approvals are currently in place to operate the current section of the mine |
| | • Updating of approvals for mine footprint expansion is an ongoing process and it is reasonably expected that any modifications to existing agreements or additional |

| Criteria | Commentary |
|---|---|
| | agreements that may be required can be obtained in a timely manner. |
| *Bulk density* | • After grade estimation air dried density was calculated from the air dried ash value using the ash-density relationship derived from the project dataset.<br>• An in-situ density value is then computed using the Preston Saunders method.<br>• In-situ moisture determinations have been collected from drill core ply samples and unweathered outcrop/trench samples taken from the active pit. |
| *Classification* | • BRL classifies resources using a multivariate approach.<br>• Coal resources have been classified on the basis of geological and grade continuity balanced by relative uncertainties surrounding historic underground extraction and proximity to faults and unconformities.<br>• Closely spaced drilling with valid samples increases the confidence for each seam in resource assessments.<br>• The confidence is reduced by:<br>   o A block being within an underground worked area due to extraction rate uncertainty.<br>   o Thin coal, where thickness is 0.5m or less.<br>   o A block lying below but within 2m of the quaternary unconformable surface. |
| *Audits or reviews* | • A review of the resource model has been carried out by the Competent Person. |
| *Discussion of relative accuracy/ confidence* | • Statistical comparisons between the resource block model and the coal quality data set have been carried out and are within expected ranges. Some anomalies exist due to non-normal data distribution. Techniques utilised include QQ plots and probability plots.<br>• Reconciliations of production versus plan are completed quarterly with coal production generally within 5-10% of the modelled coal tonnage. Production data on coal quality is insufficiently recorded to reconcile modelled coal quality. |

# Canterbury Section 4 Estimation and Reporting of Ore Reserves

| Criteria | Commentary |
|---|---|
| **Mineral Resource estimate for conversion to Ore Reserves** | • A 3D Resource Block model of topography, structure and quality is used for in-situ Resource definition.<br><br>• Mineral Resources are inclusive of Ore Reserves. |
| **Site visits** | • The Reserves Competent Person visits the site regularly. |
| **Study status** | • Canterbury is an operating mine project. The reportable Ore Reserve is based on the life of mine (LOM) plan and has determined a mine plan that is technically achievable and economically viable, and where material modifying factors have been considered. |
| **Cut-off parameters** | • Pit optimisation runs were completed to determine economic pit limits<br><br>• BRL supplied cost and revenue data.<br><br>• A maximum ROM ash of 15% (arb) and a minimum coal thickness of 0.5m are applied. |
| **Mining factors or assumptions** | • The Canterbury mining area has been operational since approximately 2005, with the current operation starting in 2013. Costs and prices are derived from actual and budget. Hence, a feasibility study was not completed.<br><br>• Mining recovery of 90% is applied to the in-situ coal. Periodically, the ROM coal production is reconciled against depletion of the mining model. Reconciliation to-date shows more coal produced than modelled from the same areas.<br><br>• The Canterbury mine utilises truck and shovel for waste and coal movement. The operations |

| Criteria | Commentary |
|---|---|
| | • are supported by additional equipment including dozers, graders, and water carts. |
| | • Geotechnical studies have been completed for Canterbury and will be required for new pits prior to development. |
| | • Moisture Adjustments: Moisture is modified during both the mining and processing operations. In situ moisture is determined by the process described in Section 3 and is the base point for all moisture adjustments. Recoverable Coal Reserves are stated on a ROM moisture basis, as received by the processing plant. Marketable Coal Reserves are stated on a product moisture basis, as sold. |
| *Metallurgical factors or assumptions* | • The ROM coal produced at Canterbury is crushed and screened on site. A process recovery of 95% is used based on a processing reconciliation study. |
| | • Product coal specifications include ash, sulphur, moisture and calorific value. |
| *Environmental* | • All environmental approvals are currently in place to operate the current section of the mine. |
| | • BRL is in the process of seeking approvals to expand the current operations. |
| | • Waste rock characterisation results show that the a portion of the waste material is acid producing, as such it requires special placement requirements and procedures in the dumps |
| *Infrastructure* | • All necessary infrastructure is in place and operational for the current operation. |
| *Costs* | • All infrastructure is in place at the Canterbury mine. The primary ongoing capital requirements are for equipment replacement and this is included in the economic model. |
| | • All operating costs were based on the 2016 Canterbury mine 3 year budget estimates provided by BRL and include allowances for royalties, commissions, mining costs, train loading and administration. |
| | • Prices are at the mine gate. Customers pay for transport. |
| | • Product specifications and penalties for failure to meet specifications were provided by BRL. |
| *Revenue factors* | • Prices are at the mine gate. Customers pay for transport. |
| | • Product specifications and penalties for failure to meet specifications were provided by BRL. |
| *Market assessment* | • Long term supply contracts are in place. |
| *Economic* | • No NPV analysis was completed as it is an operating mine. For JORC Reserves reporting purposes, detailed mine design and schedules are generated. This work includes identifying the mining sequence and equipment requirements. |
| | • BRL generates detailed cash flow schedules and identifies incremental and sustaining capital. |
| *Social* | • BRL have key stakeholder agreements in place. |
| *Other* | • All mining projects operate in an environment of geological uncertainty. The Competent Person is not aware of any other potential factors, legal, marketing or otherwise, that could affect the operation's viability. |
| | • The Competent Person understands that the pit shells the statement is based on expects extending the operation to the north and south along strike. Updating of approvals is an ongoing process and it is reasonably expected that any modifications to existing agreements or additional agreements that may be required can be obtained in a timely manner. |

| Criteria | Commentary |
|---|---|
| *Classification* | • Classification of Ore Reserves has been derived by considering the Measured and Indicated Resources and the level of mine planning.<br><br>• For the Canterbury operation, Measured Coal Resources are classified as Proved Coal Reserves and Indicated Resources classified as Probable Coal Reserves, as the mine is currently operating and the level of mine planning adequate.<br><br>• The Inferred Coal Resources have been excluded from the Reserve estimates. |
| *Audits or reviews* | • Internal review and reconciliation by BRL of the Reserves estimate has been completed. |
| *Discussion of relative accuracy/ confidence* | • Periodically, the ROM coal production is reconciled against depletion of the mining model. To date more coal has been produced than modelled from the same areas.<br><br>• Accuracy and confidence of modifying factors are generally consistent with the current operation. |

## Appendix

Maps and plans discussed within Table 1 are reported below.



**Figure 1 Location plan showing the proximity of the resource model area to regional centres and markets.**

**General geological stratigraphic column for the Malvern Hills coalfield (from Seale 2006))**
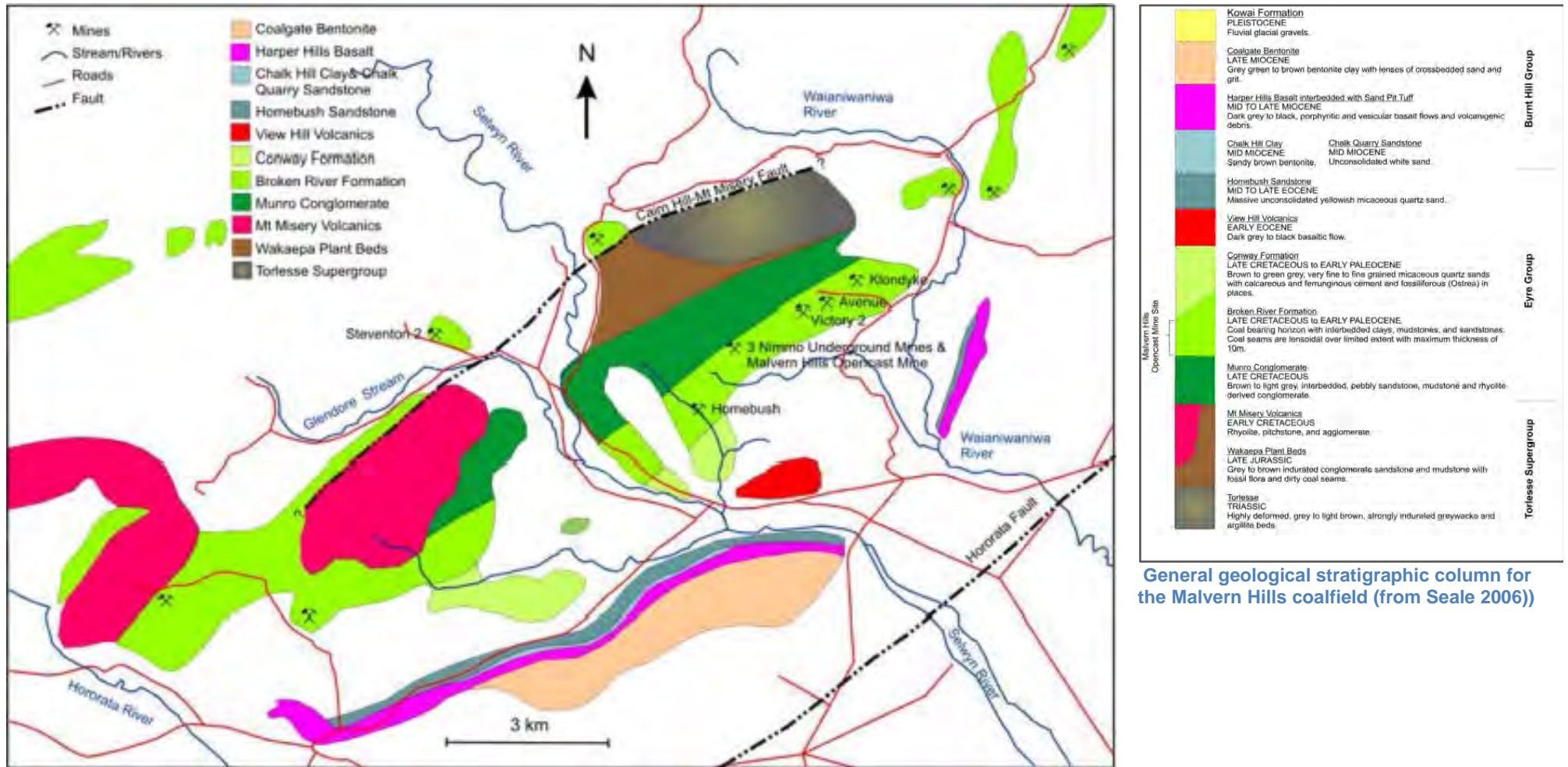
Figure 2 Generalised map of Malvern Hills Coalfield showing geological units and faults with locations of mines noted in the text (From Seale 2006 after Carlson et al., 1980; Duff, 1986; Duff and Barry, 1989; Field and Browne, 1989; Mathews, 1989; Tappenden, 2003. Refer to details below for details of the stratigraphic units).

## Legend

- RF1.0 Optimised Pit Shell
- Mining Permit 41372
- Coal rights access

**Canterbury Resource Model**

Coal Rights and Access

0   500   1,000   2,000
Meters

Sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 3.0 New Zealand licence
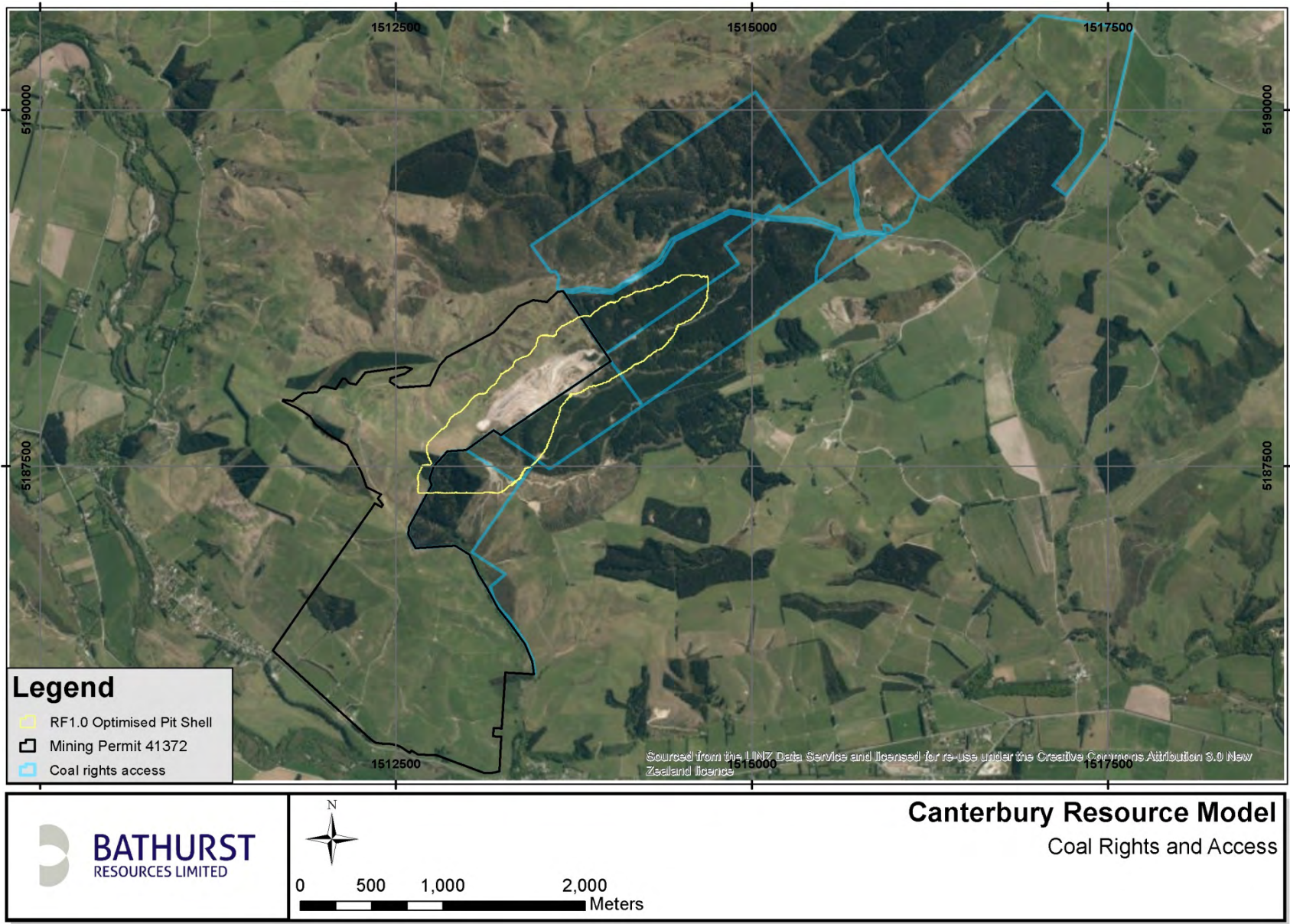
**Figure 3: Site plan indicating the location of exploration drill holes and coal right access**
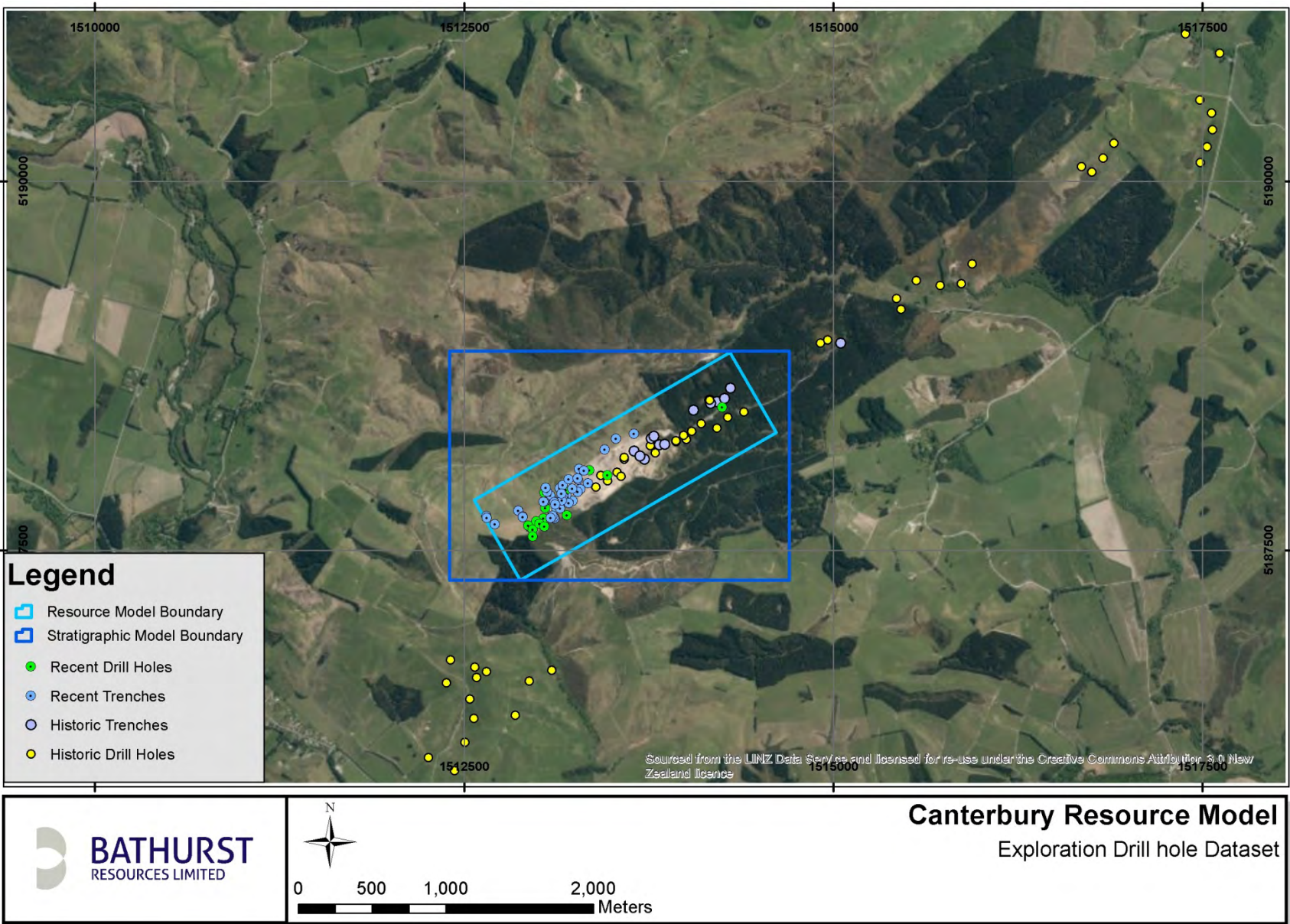
**Figure 4 Exploration drill hole dataset for the Canterbury project.**

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**Legend**

- 🔵 Resource Model Boundary
- 🔵 Stratigraphic Model Boundary
- ⬜ Mining Permit 41372
- 🟠 Surveyed Coal Floor
- 🟢 Surveyed Coal Roof
- 🔵 Other Mapping

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N

**Canterbury Resource Model**

Coal and Outcrop Mapping Data

| 0 | 250 | 500 | 1,000 |
|---|---|---|---|

Meters

Resource model boundary and Mining Permit 41372 also shown
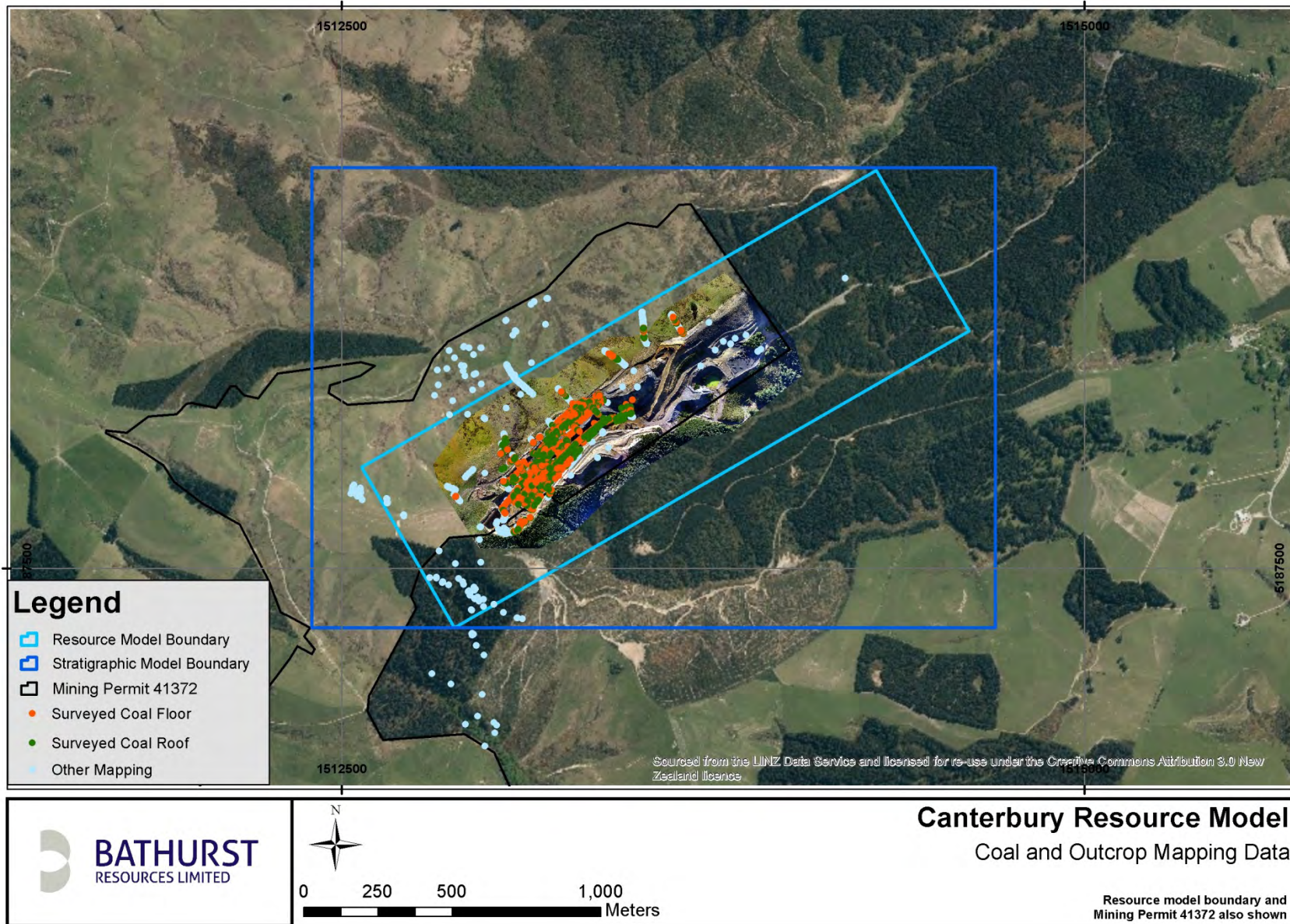
**Figure 5 The location of surveyed coal seam roof and floor mapping points. Additional mapping data is also indicated.**
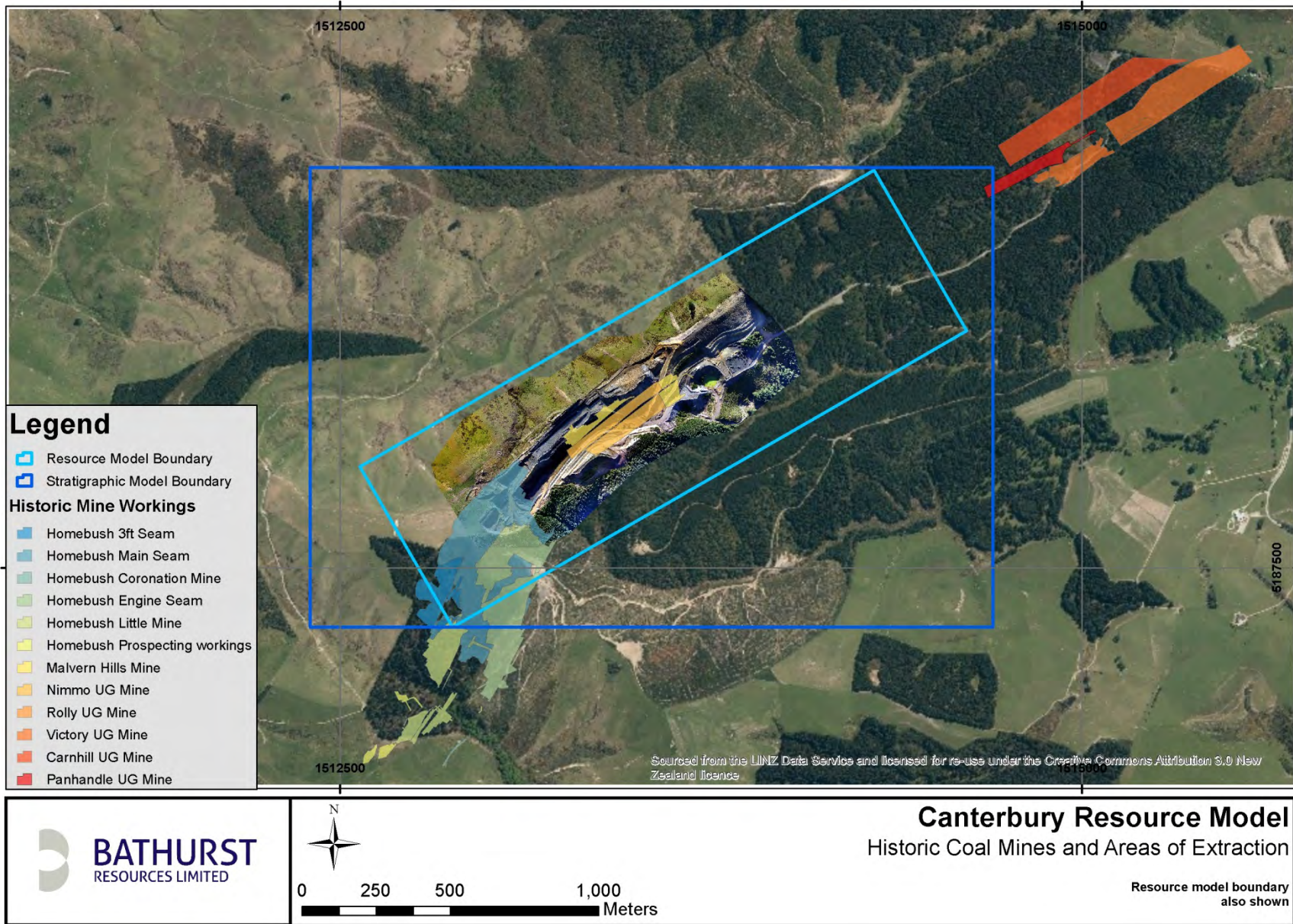
**Figure 6 Extent of historic underground coal mines in the project area.**
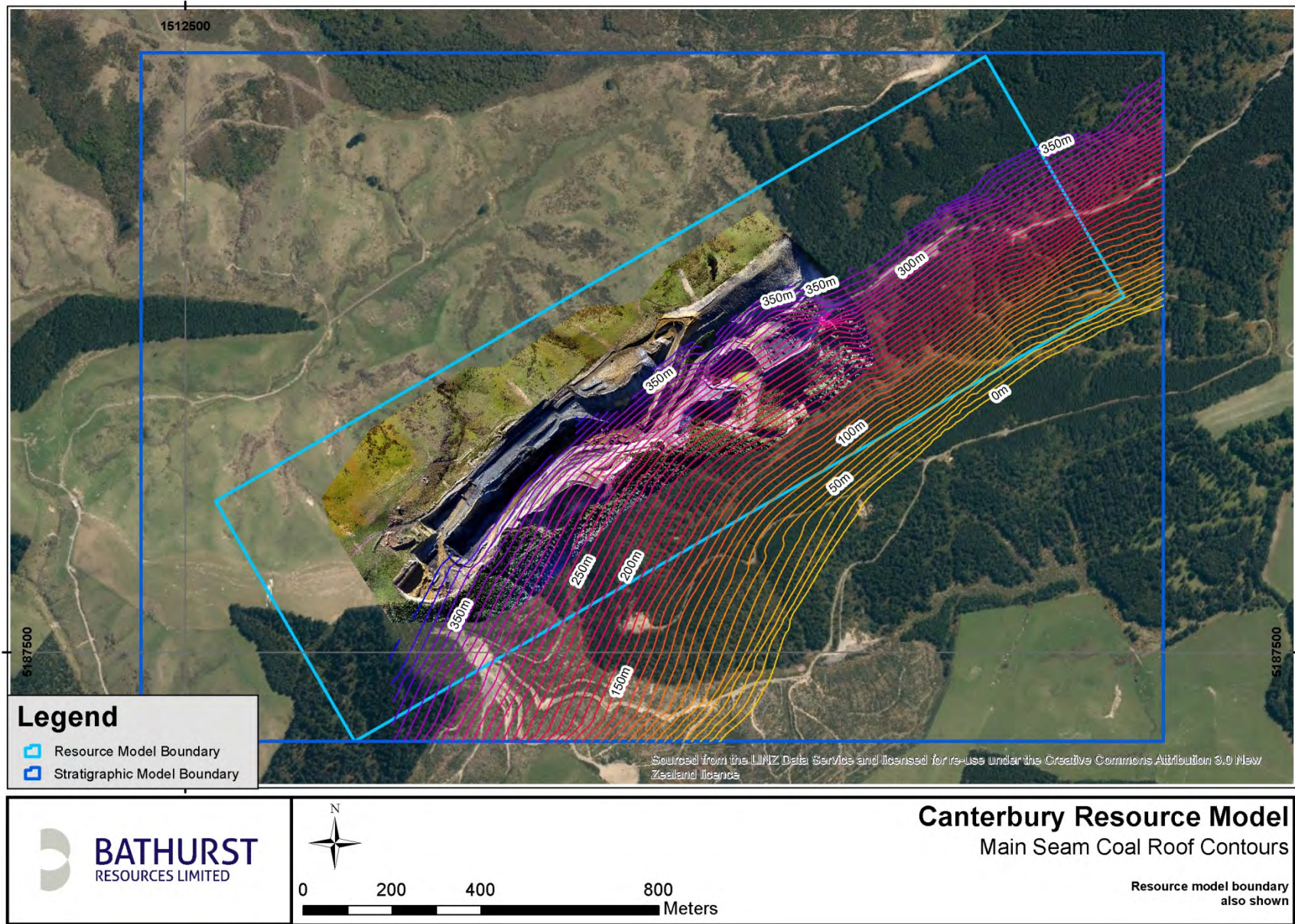
**Figure 7 Shows the structure contours of the Main Seam roof. Contours are shown at 10m levels down to sea level.**
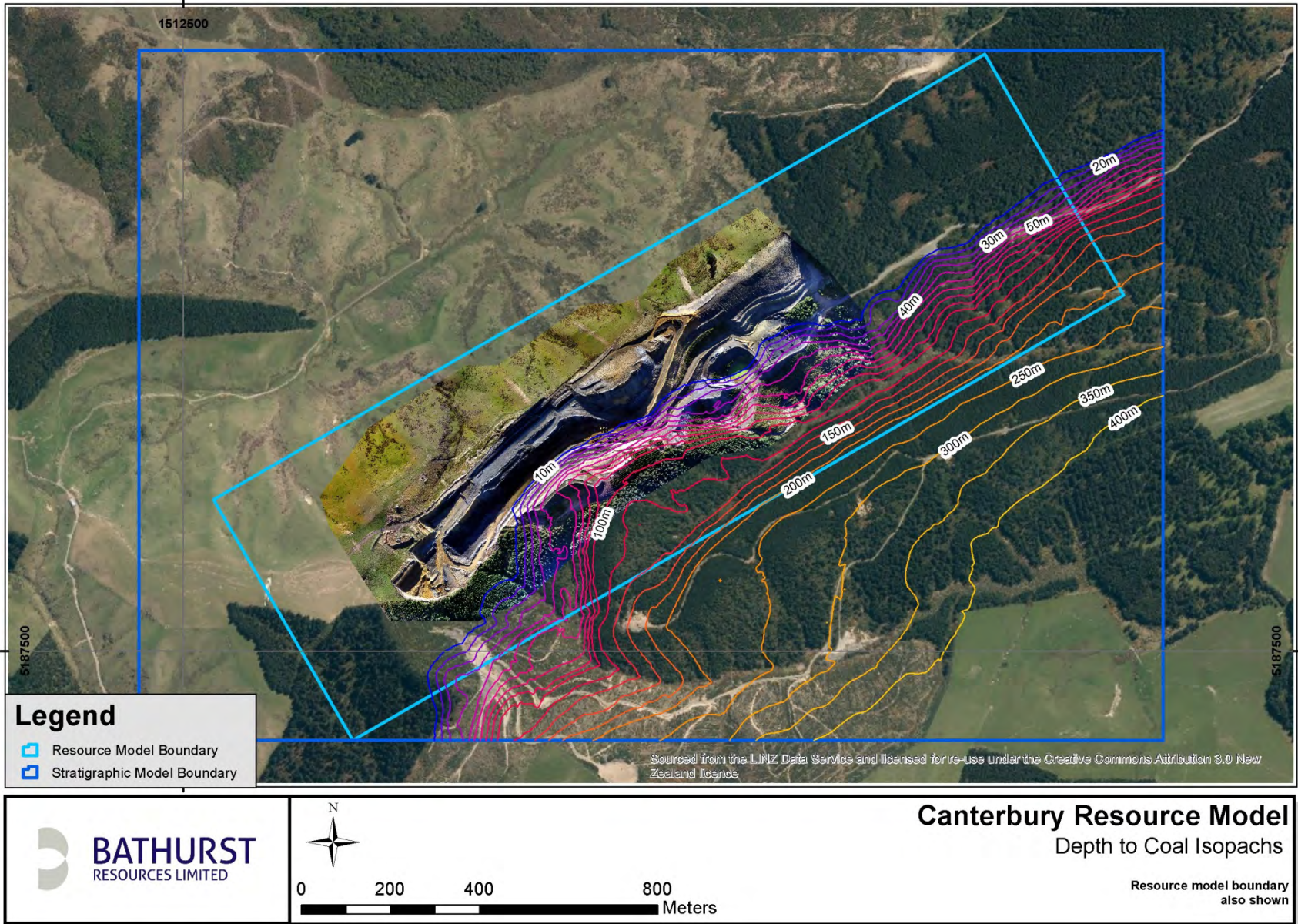
**Figure 8 Depth to the upper most coal seam.**
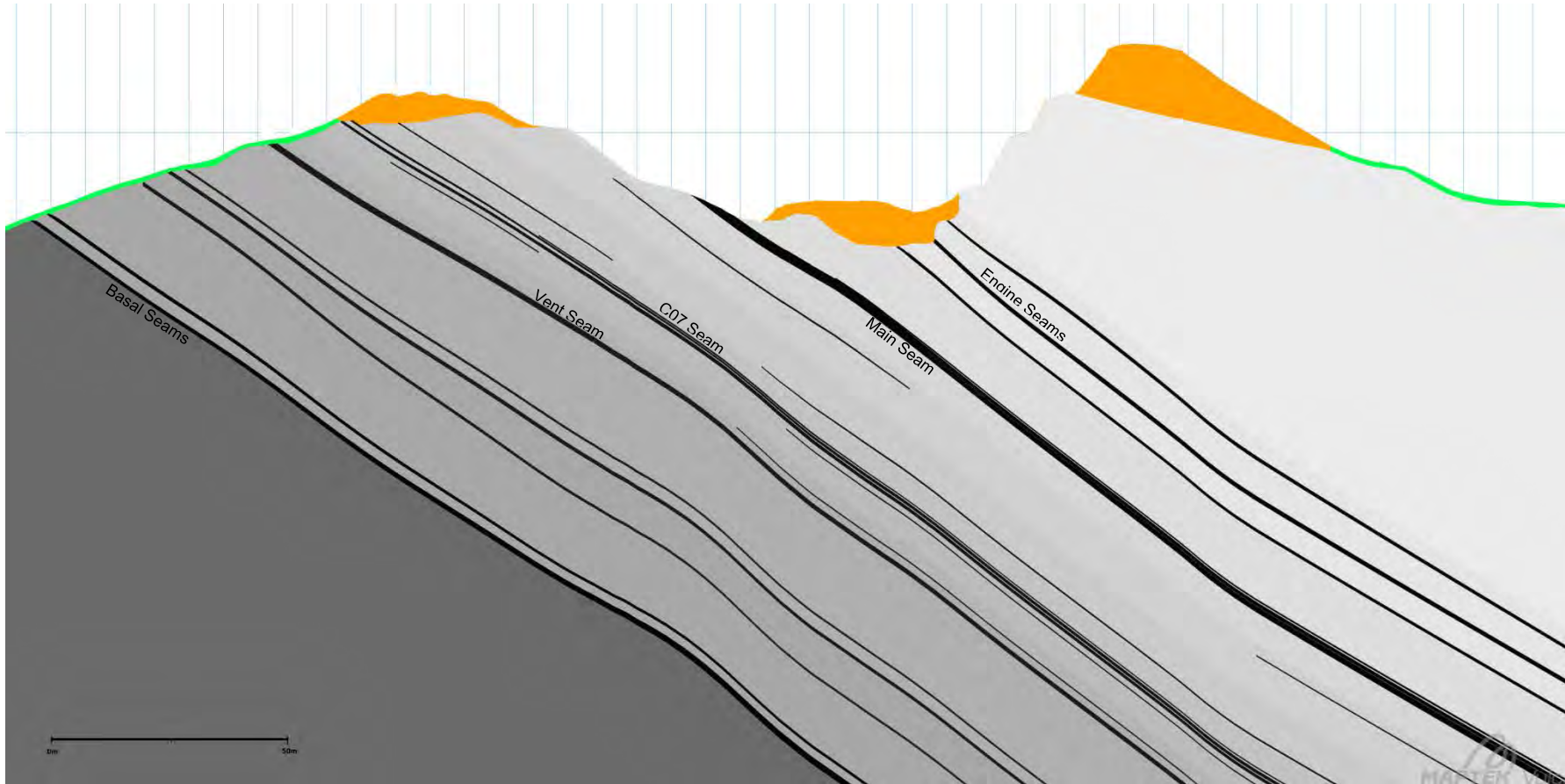
**Figure 9 Section through the working pit at Canterbury Opencast Mine. Current mining is targeting the section between the Vent seam and Engine seams. As mining progresses south stratigraphically lower seams will be targeted in addition to these seams.**

# JORC Code, 2012 Edition – Table 1 Report for the New Brighton Project 2016

## Section 1 Sampling Techniques and Data

| Criteria | Commentary |
|---|---|
| *Sampling techniques* | <ul><li>Multiple campaigns of data acquisition have been carried out in the Ohai Coal field over the past century.</li><li>Drill holes included within the New Brighton exploration dataset includes holes drilled outside of Exploration Permit (EP) 40625 and EP 51260.</li><li>A combination of open holed (wash drilled), Reverse Circulation, and cored drilling techniques has been used. Some logged and sampled trenching (channel sampling) has also been employed.</li><li>Bathurst Resources Ltd (BRL) managed exploration campaigns include data from 2013 and 2015 and consists of:<ul><li>4 Wash drilled drill holes</li><li>14 HQ/PQ triple tube (3T) diamond cored holes</li><li>8 Trenches</li></ul></li><li>Previous drilling dataset includes<ul><li>JY Series (2011)             – 8 holes</li><li>MR Series (2011)           – 5 holes</li><li>NBC Series (2011)        – 11 holes</li><li>TWB drill hole (2009)    – 1 hole</li><li>NBR Series (2007,2008) – 5 holes</li><li>ECMBDH Series (2007)   – 4 holes</li><li>OM Series (2005, 2007, 2009, 2011) – 7 holes</li><li>LMC Series (2005, 2007,2008)  – 19 holes</li><li>LMR Series (2005)        – 15 holes</li><li>PIT Series (2005)         – 19 Trenches</li><li>TP Series (1995)          – 2 holes</li><li>300 Series (1984, 1986)  – 9 holes</li><li>800 Series (1986)        – 5 holes</li><li>Historic Data of Various vintages  – 45 holes</li></ul></li></ul><br><ul><li>BRL managed drilling has aimed to infill areas to improve confidence and to test reliability of the legacy of the dataset. Two holes drilled were twinned next to an LMC Series hole to obtain coal for marketing purposes.</li><li>Downhole geophysics are available for 11 of the BRL managed drill holes.</li><li>Where available, downhole geophysics were used to correlate coal seams, to confirm depths and thickness of coal seams and to validate drillers' logs. Geophysics were also used to accurately calculate recovery rates of coal intersections.</li><li>Ply samples were generally taken over intervals no greater than 0.5m and included the full core sample.</li><li>Outcrop trench and channel data is entered into the drilling database in a form that replicates a drill hole at that location. Coal seam thickness and partings between seams were measured vertically.</li><li>All analytical data has been assessed and verified before inclusion in the resource model. Unreliable data is omitted.</li></ul> |
| *Drilling techniques* | <ul><li>All BRL managed drilling campaigns have utilized the following drilling methods<ul><li>Full PQ Triple tube core</li><li>Full HQ Triple tube core</li><li>Combination wash drill / Triple tube core</li></ul></li><li>Legacy drilling techniques include<ul><li>HQ Triple Tube Core</li><li>Reverse Circulation 133mm</li><li>Wash drilled using tricone/blade/strata bits</li><li>Rotary wash, fishtail bit</li></ul></li></ul> |

| Criteria | Commentary |
|---|---|
| | • Excavated trenches with logged intersections make up 10-15% of the primary sample dataset. |
| *Drill sample recovery* | • Core recovery was measured by the logging geologist for each driller's run (usually 1.5m) in each drill hole. If recovery of coal intersections dropped below 90% the drill hole required a redrill. In the 2013 drilling program drillers were paid an incentive if coal recovery was above 90%.<br>• Average total core recovery over BRL managed drilling campaigns was 83.4% with core recovery of coal at 89.6% (this increases to 95.4% when NC085 is excluded. NC085 may have intersected the edge of underground workings).<br>• Where small intervals of coal were lost, and geophysics indicated strongly that coal was lost, ash values were estimated using the results of overlying and underlying ply samples and the relative response of the down hole density trace.<br>• Little recovery data is available for historic drill holes and those of previous operators. |
| *Logging* | • BRL has developed a standardized core logging procedure and all core logging completed by BRL has followed this standard.<br>    o Drill core has been geologically and geotechnically logged by logging geologists under the supervision and guidance of a team of experienced exploration and geotechnical geologists.<br>    o Drill core was photographed prior to sampling. Depth meter marks and ply intervals are noted on core in each photograph.<br>    o Down hole geophysical logs were used to aid core logging and adjust depth.<br>• The standard of logging varies for legacy drilling campaigns. |
| *Sub-sampling techniques and sample preparation* | • For all exploration and resource modeling data acquired by BRL an in-house detailed sampling procedure was used.<br>    o Ply samples include all coal recovered for the interval of the sample. Core was not cut or halved.<br>    o The diamond core was lithologically logged and the lithology intervals were used to determine actual coal quality ply sample depth at the drill site or in the core shed.<br>    o All diamond core samples were collected as soon as practicable after drilling and double bagged then sent to the SGS Minerals Laboratory in Ngakawau where they were crushed and split at the laboratory.<br>• Some legacy campaigns did cut/halve coal ply samples.<br>• The legacy drilling campaigns vary in the standard of sampling processes, some of which are unknown. |
| *Quality of assay data and laboratory tests* | • SGS has been the predominant accredited laboratory used by BRL for coal quality testing on exploration drill holes used in the resource model.<br>• SGS has used the following standards for their assay test work.<br>    o Proximate Analysis is carried out to the ASTM 7582 standard<br>    o Ash has also used the standard ISO 1171<br>    o Volatile matter has also used the standard ISO 562<br>    o Inherent moisture has also used the ISO 5068<br>    o Total sulphur analysis is carried out to the ASTM 4239 standard<br>    o Calorific value results are obtained using the ISO 1928 standard.<br>    o Loss on drying data is completed using the ISO 13909-4 standard.<br>    o Relative Density is calculated using the standard AS 1038.21.1.1<br>• CRL Energy Ltd completed much of the assay test work for samples collected prior to BRL taking over the projects.<br>• CRL used the following standards for their test work;<br>    o Inherent Moisture tests utilized the ISO 117221 standard<br>    o Ash tests utilized the ISO 1171 standard<br>    o Volatile matter tests utilized the ISO 562 standard<br>    o Calorific value tests utilized the ISO 1928 standard<br>    o Both SGS and CRL are accredited laboratories.<br>• All analysis was carried out and reported on an air dried basis unless stated otherwise. |
| *Verification of sampling and assaying* | • Sample assay results have been cross referenced and compared against lithology logs and downhole geophysics data. Results are also inspected by experienced geologists and compared with expected values utilising known coal quality relationships for the Nightcaps/Ohai coalfield. |

| Criteria | Commentary |
|---|---|
| | • Anomalous assay results are investigated, and where necessary the laboratory is contacted and a reanalysis undertaken from sample residue.<br>• Laboratory data is imported directly into an Acquire database with no manual data entry at either the laboratory or at BRL.<br>• Geophysical data has been used to establish coal seam thickness and depths on the margins of coal seams in RC drill holes where sampling uncertainty inherent in RC drilling made coal sample and intersection depths less reliable. |
| *Location of data points* | • New Zealand Trans Mercator 2000 Projection (NZTM) is used by BRL for the Canterbury project area. NZTM is considered a standard coordinate system for general mapping within New Zealand. Historic data has been converted from various local circuits and map grids using NZ standard cadastral conversions.<br>• LiDAR and digital imagery was acquired in April 2013 using an Optech M200 LiDAR system and CS8900 medium format digital camera.<br>• The data was collected flying 1,300m above the lowest ground and using a scanner field of view of 44 degrees. Outgoing pulse rate was set at 70kHZ and minor scan frequency 33.5 Hz.<br>• The topographic surface used to build the model is derived from a combination of Lidar data, and LINZ topographical data where Lidar coverage in outer areas is unavailable.<br>• Historic data has been converted from various local circuits and map grids to NZTM.<br>• Surveyed elevations of drill hole collars are validated against the Lidar topography. |
| *Data spacing and distribution* | • Data spacing for the New Brighton project has been calculated by finding the radius required to fill the total area of the EP40625 permit divided by number of drill holes within that area. The central area of the permit has a lower average DH spacing.<br>• The project has an average primary sample spacing of 240m however New Brighton central has an average primary sample spacing of 112m<br>• Drill hole spacing is not the only measurement used by BRL to establish the degree of resource uncertainty and therefore the resource classification. BRL uses a multivariate approach to resource classification which is explained further in Section 3: Classification.<br>• The current drill hole spacing is sufficient for coal seam correlation purposes in the majority of the areas. Difficulties lie in seam correlation due to the abundant seams and often complex structural mechanisms such as faults and unconformities.<br>• Many drill holes have not been drilled deep enough to intersect all seams in the stratigraphic sequence, or have not completed diagnostic tests confirming Ohai group or Nightcaps group coal measures.<br>• Only 75% of drill holes have had downhole geophysics completed which is important for coal seam correlations.<br>• The samples database is composited to 0.4m sample length prior to grade estimation. This is the mean sample length from BRL managed drilling.<br>• Compositing starts at the top of seam and small samples are not distributed or merged. |
| *Orientation of data in relation to geological structure* | • All recent exploration drilling has been completed at a vertical orientation.<br>• All previous drill holes are vertical except one; those without deviation plots are assumed to be vertical. OM07b was drilled as a coal seam gas hole (250m west of EP40625) and was deviated towards horizontal to drill through a thick seam to intersect OM05. OM07b is not used in the modelling process.<br>• Any deviation from the vertical is not expected to have a material effect on shallow, open pit resources. Average drill hole depth in the dataset is 96m however 18 holes have a depth >200m.<br>• The majority of the deposit presents a moderate seam dip between 10° – 20° although some localized steep dips do exist near fault traces.<br>• Vertical drilling is considered to be the most suitable drilling method of assessing the coal resource at the New Brighton Project. |
| *Sample security* | • Stringent sample preparation and handling procedures have been followed by BRL. Ply samples are taken and recorded from drill core, sealed in plastic and sent directly to the laboratory.<br>• It is not considered likely that individual coal samples face a risk of theft or sabotage as coal is a bulk commodity with little value for small volumes of coal from drill core. |
| *Audits or* | • BRL has reviewed the geological data available and considers the data used to produce the resource model is reliable and suitable for the purposes of generating a reliable resource |

| Criteria | Commentary |
|----------|------------|
| *reviews* | estimate.<br>• Senior geologists undertake audits of the sample collection and analysis processes. |

## Section 2 Reporting of Exploration Results

| Criteria | Commentary |
|----------|------------|
| *Mineral tenement and land tenure status* | • The New Brighton Resource Model includes two exploration permits owned by BRL and privately held land coal rights attached to land titles in and around the Ohai Township and to the west and east of EP 40625. An area of open ground exists to the east of EP 40625 and is included in the model area. Coal resources have only been reported within EP40625.<br>• Exploration Permit 51260 covers an area of 690.51 Hectares, parts of which lie within the modelled area.<br>• Exploration Permit 40625 covers an area of 658.37 Hectares. It is considered that there are reasonable prospects to convert all or part of the EP to a mining permit. |

| Permit/Rights | Operation | Mining Type | Expiry |
|---------------|-----------|-------------|--------|
| **Exploration Permit 51620** | Ohai | Opencast, Underground | 14/04/2020 |
| **Exploration Permit 40625** | Ohai | Opencast, Underground | 02/09/2017 |

| | • It is considered that there are reasonable prospects to negotiate access arrangements for mining with land owners covering the reported resource areas. |
|----------|------------|
| *Exploration done by other parties* | • The majority of the New Brighton exploration drilling was carried out by the L & M Group of companies between 2005 and 2011.<br>• Historic data has been traced back to original reports and logs held at Archives NZ storage centers. Historical data has been thoroughly investigated for reliability and quality and where the integrity of the data is limited it has been omitted from the model. Historic data includes old underground workings plans, geological reports and drilling logs. |
| *Geology* | • The Project is located in the Ohai Coal field, New Zealand.<br>• The Ohai Coalfield is a fault bounded basin containing Cretaceous sub-bituminous coal.<br>• The defined resource is contained within the New Brighton, Morley and Beaumont Formations.<br>• The Cretaceous Ohai Group contains three formations – the Wairio, New Brighton and the Morley Formations.<br>• The Eocene Nightcaps group contains two formations – the Beaumont and Orauea Formations.<br>• The two groups are separated by an unconformity clearly distinguishable by micro-flora.<br>• Most production has come from seams in the Morley Formation which tend to have higher quality coal. Coal seams are faulted and folded into complex structures. Coal thickness and extent varies as seams are often lenticular and split or washed out by fluvial sand channels and syndepositional faulting and folding are indicated<br>• Morley coal measures of the Ohai Group have a combined vertical seam thickness which averages 4.1m however 50m thick seams have been recorded in OM05 250m west of the permit.<br>• Coal ranks range from sub-bituminous A to high volatile bituminous C.<br>• Eocene Beaumont coal measures of the Nightcaps Group have a combined vertical seam thickness which averages 1.4m however 7m thick seams have been recorded within the Coaldale pit. Coal ranks from sub bituminous C-B rank.<br>• The Nightcaps Group Beaumont Formation coal measures are conformably overlain by Eocene Orauea Formation mudstone. |

| Criteria | Commentary |
|---|---|
| | |

| Drill hole Information | **Table 1 Showing summary of drilling data available within the model area.** |

| Years | Agency | Range of Collar ID | # Holes | Drilling Method | # Holes in structure model | # holes in quality model | Geophysics Available |
|---|---|---|---|---|---|---|---|
| 1923 - 1955 | Various | Various | 45 | unknown | 24 | 2 | 0 |
| 1984 | State Coal Mines | 351 - 355 | 3 | Cored | 3 | 1 | 3 |
| 1986 | Lime & Marble Ltd | 371 - 379 | 6 | Cored | 6 | 5 | 6 |
| 1986 | Mines Department | 882 - 886 | 5 | Cored, washdrilled | 5 | 5 | 5 |
| 1995 | Southgas Resources Ltd | TP05-06 | 2 | Wash drilled | 2 | 0 | 2 |
| 2005 | Kenham Holdings Ltd (L&M) | PIT01 - PIT18, PIT_4m | 19 | Trench | 8 | 3 | 0 |
| 2005 | L&M | LMR05 - LMR19 | 15 | RC hammer | 14 | 8 | 9 |
| 2005 | L&M | LMC01 - LMC03 | 3 | HQ triple tube | 3 | 3 | 0 |
| 2005 | L&M | OM1 | 1 | Cored, washdrilled | 1 | 1 | 0 |
| 2007 | Eastern Corporation | ECMBDH01 - ECMBDH05 | 4 | Trench | 4 | 0 | 4 |
| 2007 | L&M | LMC04 - LMC11 | 8 | Triple tube core, OH, RC hammer | 8 | 7 | 8 |
| 2007 - 2011 | L&M | OM2 - OM7, OM7a, OM7b | 6 | Wash drilled | 3 | 0 | 3 |
| 2007 - 2008 | L&M | NBR01 - NBR06 | 5 | triple tube | 5 | 1 | 0 |
| 2008 | L&M | LMC13 - LMC21 | 8 | triple tube core | 8 | 4 | 6 |
| 2009 | L&M (Nightcaps Contracting) | TWB-01 | 1 | Wash drilled | 1 | 0 | 1 |
| 2011 | L&M | NBC11-1 to NBC11-23 | 11 | HQ triple tube | 9 | 4 | 6 |
| 2011 | L&M | MR1 - MR5 | 5 | triple tube core | 5 | 1 | 5 |
| 2011 | L&M | JY2 - JY9 | 8 | triple tube core | 8 | 6 | 6 |
| 2013 | Bathurst Resources Ltd | NC079 - NC085 | 7 | triple tube core | 5 | 5 | 3 |
| 2015 | Bathurst Resources Ltd | NBT001 - NBT008 | 8 | Trench | 2 | 2 | 0 |
| 2015 | Bathurst Resources Ltd | NC119 - NC129 | 11 | triple tube core, Open holed | 7 | 6 | 8 |

- Exploration drilling results for individual holes have not been reported.
- As coal is a bulk commodity the exclusion of detailed exploration data from this report is considered to not be material to the understanding of the report.

| Data aggregation methods | - The nominal cut-off for ash (ad) for constructing the New Brighton resource model is set at 35%. <br> - The resource model is built as a block model with 0.5m block thicknesses for coal. Coal ply data is used to grade estimate the block model. |
|---|---|
| Relationship between mineralisation widths and intercept lengths | - All exploration drill holes have drilled vertically and the coal seam is generally gently dipping, therefore the reported seam intercept thickness is representative of the true seam thickness. |
| Diagrams | - Coal quality isopach plots and coal structure contour plots for New Brighton, Morley and |

| Criteria | Commentary |
|---|---|
| | Beaumont coal are shown in the appendix. |
| *Balanced reporting* | • As coal is a bulk commodity detailed exploration drilling results and coal intersections have not been reported. |
| *Other substantive exploration data* | • Exploration drilling results have not been reported in detail.<br>• Some coal composite samples for full seam, minable sections have been taken for thorough analysis including ash constituents, forms of sulphur, ash fusion temperatures, and ultimate analysis. These composite samples are not used in grade estimation.<br>• A bulk sample of ~5000 tonnes was taken in 2013 from the New Brighton Central prospect. Coal quality results from this sample on an as received basis were 4.7% ash and CV of 21.6 MJ/kg. |
| *Further work* | • The final work program commitment for EP40625 is due in 2017. This program of work includes drilling a number of cored holes to define a mineable reserve, updating mining studies including mining costs, constraints to mining, water management studies, and detailed mine planning and scheduling, leading to a technical pre-feasibility study. |

## Section 3 Estimation and Reporting of Mineral Resources

| Criteria | Commentary |
|---|---|
| *Database integrity* | • All historic and legacy datasets have been thoroughly checked and validated against original logs and results tables.<br>• BRL utilizes an Acquire Database to store and maintain its geological exploration dataset.<br>• An Acquire database places explicit controls on certain data fields as they are entered or imported into the database such as overlapping intervals, coincident samples, illegal sample values and standardized look-up tables for logging codes etc.<br>• Manual data entry of assay results is not required as results are imported directly.<br>• The database is automatically backed up on an offsite server. |
| *Site visits* | • Hamish McLauchlan (the Competent Person) has worked for the past 20 years on coal projects throughout New Zealand. The Competent Person visits the site regularly. |
| *Geological interpretation* | • BRL has confidence in the geological model and the interpretation of the available data. Confidence varies for different areas and this is reflected by the resource classification.<br>• Dry mineral matter and sulfur free volatile matter is the principal quality used to differentiate and correlate Beaumont and Morley coal seams where palynology samples are unavailable.<br>• BRL considers the amount of geological data sufficient to estimate the resource, however an increased data density may increase confidence of some areas.<br>• Uncertainty surrounds the historic mine workings, both in the quality and quantity of coal extracted and the surveying of underground workings. This is reflected in the resource classification.<br>• Some residual uncertainty of quality and confidence of legacy drilling data remains despite thorough evaluation of the logs and drill locations. |
| *Dimensions* | • A number of coal seams are present in the stratigraphic sequence. Up to three coal seams exist in each of the Beaumont, Morley and New Brighton Formations, with one existing in the Wairio Coal Measures. The total combined coal thickness varies from less than 1m thick up to 50m thickness locally (gas drill hole OM05).<br>• The model covers an area 4.8km by 4.85km.<br>• Two primary prospect areas exist within EP 40625. These are New Brighton Central covering an approximate area of 1.5km by 0.5km, and the Mossbank West prospect covering an area approximately 1km by 0.5km.<br>• The deepest coal reported as resources lies 130m below the surface. All resources are contained within an RF 1.0 optimized pit shell using current mining at Takitimu based on appropriate economics for the New Zealand domestic market. |
| *Estimation and modeling techniques* | • All available and reliable exploration data has been used to create a geological block model which has been used for resource estimation and classification.<br>• All exploration drilling data is stored in Acquire and exported into a Vulcan drill hole database. |

| Criteria | Commentary |
|---|---|
| | • Mapping data is stored in Acquire and is exported into Vulcan. |
| | • Interpretive design data is stored within Vulcan in various layers. |
| | • Due to the model having two unconformable coal bearing formations the model is subdivided into two separate domains for formation (Ohai Group and Nightcaps Group). The Ohai Group seams are truncated by the unconformable Beaumont coal measures. |
| | • Each domain is modeled for structure and grade separately. |
| | • Vulcan is used to build the structure model. Grid spacing is 10m x 10m for New Brighton Central prospect and 25m x 25m for the remainder of the project area. |
| | • Maptek's Integrated Stratigraphic Modeler module is used to produce the structure model. The stacking method is used which triangulates a reference surface and then stacks the remaining horizons by adding structure thickness. |
| | • Structure grids are checked and validated before being used to construct the resource block model. |
| | • Vulcan is used to build the block model and to grade estimates. The process is automated using a Lava script. |
| | • The stratigraphic structure grids for each domain, along with lidar topography surface, and Beaumont unconformity surface were used to build the block model. The block dimensions were constructed at 10m x 10m for the New Brighton Central prospect and 25m x 25m for the remainder of the project area. Vertical thickness for the coal blocks is 0.5m for both models. |
| | • Grade estimation is performed utilizing Vulcan's Tetra Projection Model at the first daughter level. Coal qualities are estimated on an air dried basis except bed moisture. Ash, sulphur, inherent and total moisture, volatile matter, and calorific value are estimated simultaneously. |
| | • Grade estimation is computed using an inverse distance function with power of 2.5. |
| | • Various methods have been used to check the validity of the block estimation. This includes manual inspection of the model, QQ plots of the model qualities vs coal quality database and other comparison tools. |
| | • Resource tonnages within the model have been discounted where the resource falls within historic underground workings areas. The primary mining method utilised historically in the New Brighton and Mossbank areas is bord and pillar mining and opencast mining. Historic extraction rates are estimated using old mining extraction reports, and tonnage reports. The extraction rates used to discount coal tonnages in the resource model are as follows: |

| Mining Method | Extraction Rate |
|---|---|
| Underground workings | 50% of all seams |
| Opencast | 100% of all seams |

| Criteria | Commentary |
|---|---|
| | • Behre Dolbear Australia Pty Limited (BDA) notes that Bathurst has adopted a procedure over old workings of discounting the estimated resources to account for the depletion of coal from underground mining and to account for possible structures not identified by drilling. Based on reconciliations from mining to date at Takitimu, this approach has been established as a reasonably reliable, if somewhat conservative, method of estimating resources where there are clearly areas of depletion. BDA accepts that this appears to be a reasonable approach, but cautions there will be areas where the resources may differ from the estimates. |
| | • No acid mine drainage is thought to occur within the Ohai Coalfield due the nonacid forming lacustrine depositional environment of the coal measures and acid generation test work has not been completed at New Brighton as it is assumed the coal measures at New Brighton exhibit the same nonacid forming behavior. |
| *Moisture* | • Moisture, both on an air dried and total moisture basis, is estimated in the resource model from the sample database after using a cutoff envelope to cut samples that vary excessively from the norm. Natural variability in bed moisture is amplified by excessive variability in the sampling process, and laboratory testing methods between labs and over time |
| | • Where ply sample results do not include moisture, moisture is calculated using a derived relationship of moisture vs ash. |
| | • Resource tonnages are reported using natural bed moisture, calculated using the Preston Sanders equation. |
| *Cut-off parameters* | • Structure grids have been developed based on a 35% ash cutoff. Some higher ash intervals are retained within the coal quality dataset to allow simplification of the seam model. |

| Criteria | Commentary |
|---|---|
| | • No lower ash cutoff has been applied.<br>• Coal resources are reported down to a seam thickness of 0.5m (one block) with an ash cutoff of 25%.<br>• Resources have been defined as economic by using a breakeven Lerchs-Grossman optimized opencast pit shell which is run over all the coal within the resource model. No resources have been reported outside of this pit shell. |
| *Mining factors or assumptions* | • No mining factors such as mining losses and dilutions have been applied when developing the resource model however current economic and mining parameters for domestic coal sales were used to define the RF1 optimized pit shell which was used to define coal that has reasonable prospects for *eventual economic extraction*. |
| *Metallurgical factors or assumptions* | • No metallurgical assumptions have been applied in estimating the resource. It is not expected that a wash plant would be required for coal processing. |
| *Environmental factors or assumptions* | • No environmental assumptions have been applied in developing the resource model.<br>• It is assumed that overburden is not acid forming as is the case at other mines in the Ohai coal field. |
| *Bulk density* | • A total of 66 relative density (air dried) sample results are available for the New Brighton project area.<br>• The samples are distributed throughout the Takitimu-Coaldale-Black Diamond project area and the sample set covers a range of ash values from 1.7% to 56.2%.<br>• From this dataset an ash-density curve was generated with a coefficient of determination of $R^2=0.98$ for New Brighton Coal, $R^2=0.92$ for Morley Coal, and $R^2=0.84$ for Beaumont coal.<br>• Air dried density is calculated using the air dried block ash value and the derived density equations.<br>New Brighton coal: Density (ad) = (0.0091 * ash) + 1.3181<br>Morley coal: Density (ad) = (0.0097 * ash) + 1.2944<br>Beaumont coal: Density (ad) = (0.0105 * ash) + 1.25<br>• An insitu bulk density value is computed using the Preston Saunders method;<br>Density (ps) = (RD * (100 – mo_ad)) / (100 + RD*(mo_ar - mo_ad)- mo_ar)<br>Where RD is relative density on an air dried basis, mo_ad is inherent moisture, and mo_ar is total moisture. |
| *Classification* | • BRL classifies resources using a multivariate approach.<br>• Coal resources have been classified on the basis of geological and grade continuity balanced by relative uncertainties surrounding historic underground extraction and proximity to faults and unconformities.<br>• Closely spaced drill holes with valid coal quality samples (point of observation) increases the confidence in resource assessments.<br>• The confidence is reduced by:<br> o A block being within an area of historic underground workings due to extraction rate uncertainty.<br> o A block being within 20m of historic underground workings due to uncertainty with historic survey of the workings and georeferencing of mine plans.<br> o A block is in an area where structure dip is greater than 20° due to proximity to large faults. Faulting can impact coal thickness and quality and some faults are poorly constrained.<br> o A block lying within an area with thin seams resulting in uncertainty of geological continuity. Where a seam is thin or is splitting, a small change in thickness can have a large impact to reported coal tonnages and qualities.<br> o A block being within an area close to a possible 'washout' or erosion of Morley coal as indicated by historic underground mine plans and extents.<br> o A block underlies the modelled regional unconformity between Beaumont and |

| Criteria | Commentary |
|---|---|
| | Morley formations by less than 2m due to uncertainties in unconformity surface topology.<br><br>**Essentially, in an area that is not affected by the above conditions, a distance to nearest sample of less than 75m would be classified as Measured, less than 120m is classified as Indicated and less than 300m would be classified as inferred.** |
| *Audits or reviews* | • An internal review of the resource model has been carried out by BRL. |
| *Discussion of relative accuracy/ confidence* | • The Competent Person has reviewed the resource estimates and has visited the New Brighton project area. The Competent Person has examined the methodology used to estimate the resources and reserves and is satisfied that the processes have been properly conducted. The estimation methodology is generally in accordance with, if not at a higher standard to, industry practice and the estimates can be regarded as compliant under the JORC 2012 code.<br>• Statistical comparisons between the resource block model and the coal quality data set have been carried out and are within expected ranges. Techniques utilised include QQ plots and probability plots. |

# Appendix
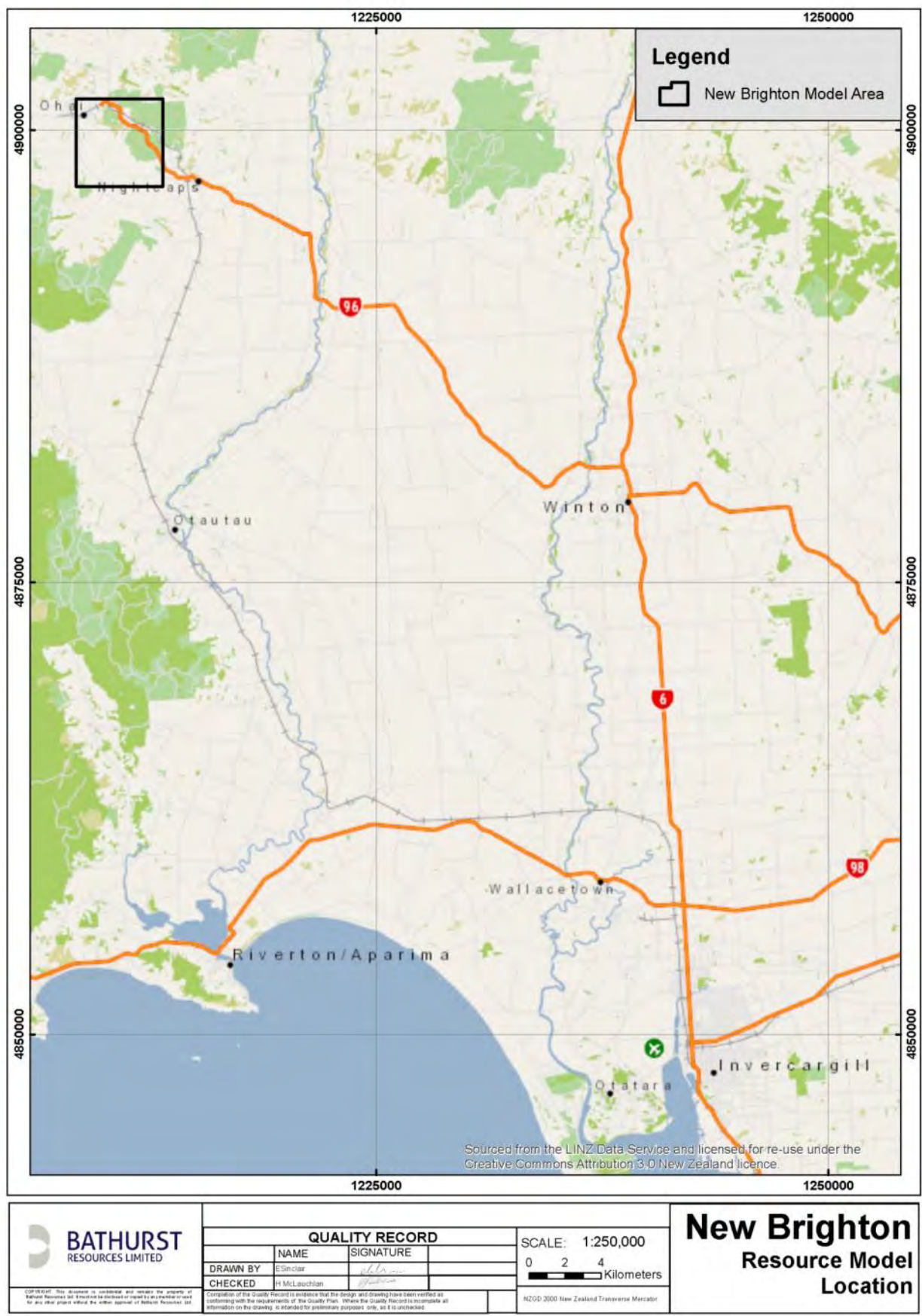


**Figure 1  Location of New Brighton Project**

**Figure 2 Shows BRL Owned Coal Exploration Permits within the New Brighton Model Area**
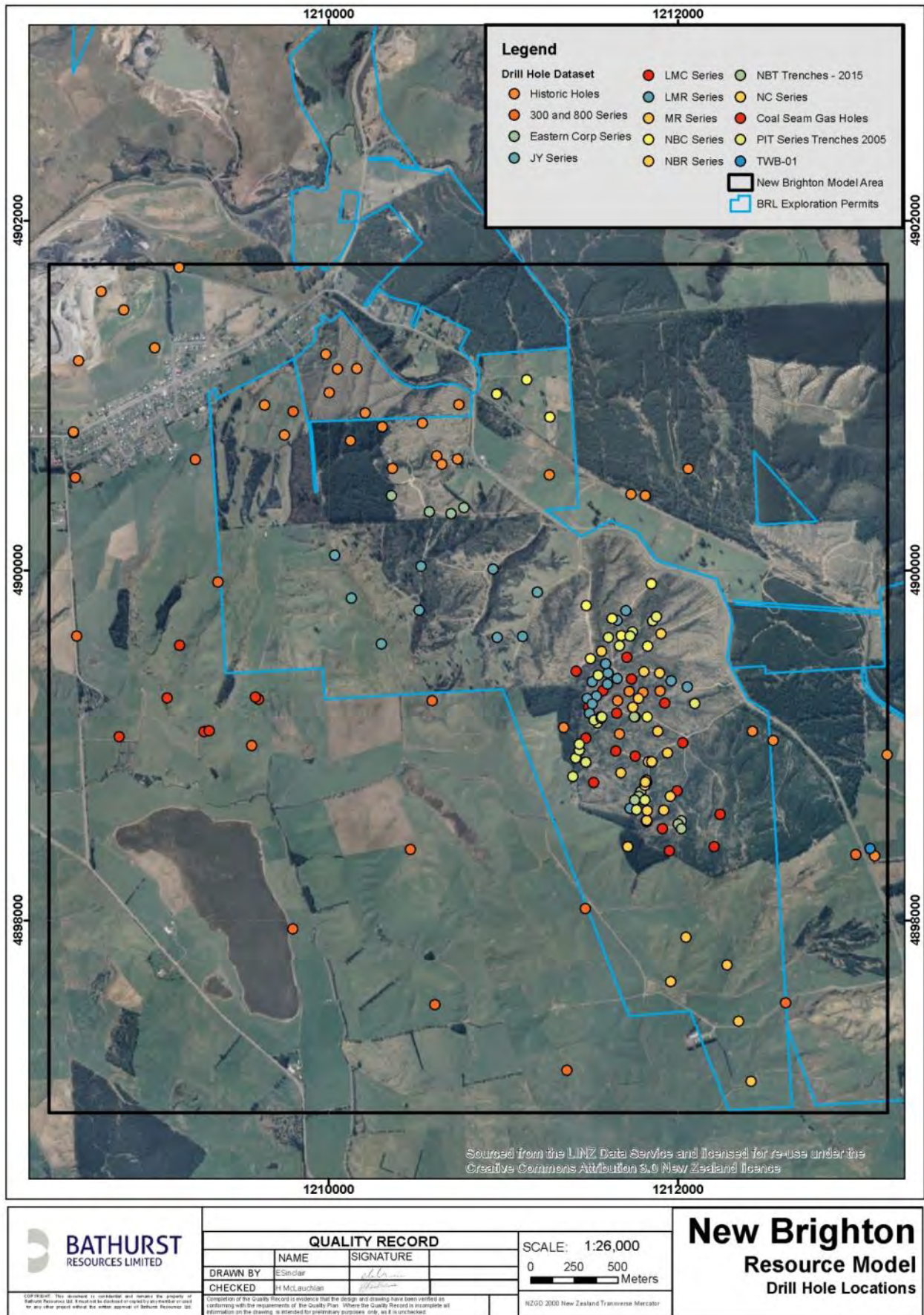
**Figure 3  Location of Drilling within Resource Area**
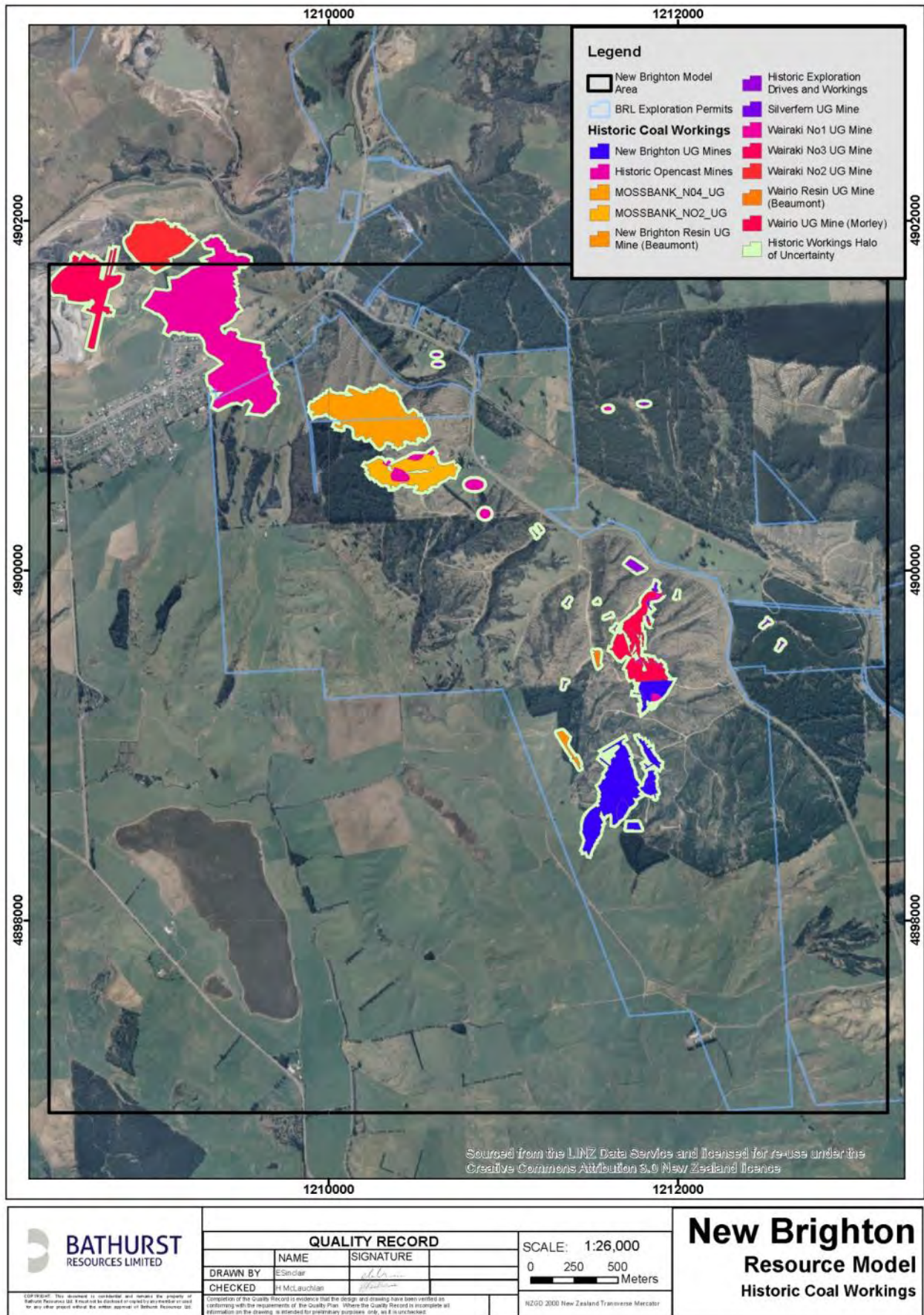
**Figure 4  Location of Historic Mine Workings. Note: Recent Opencast Mined Areas Are Not Shown**
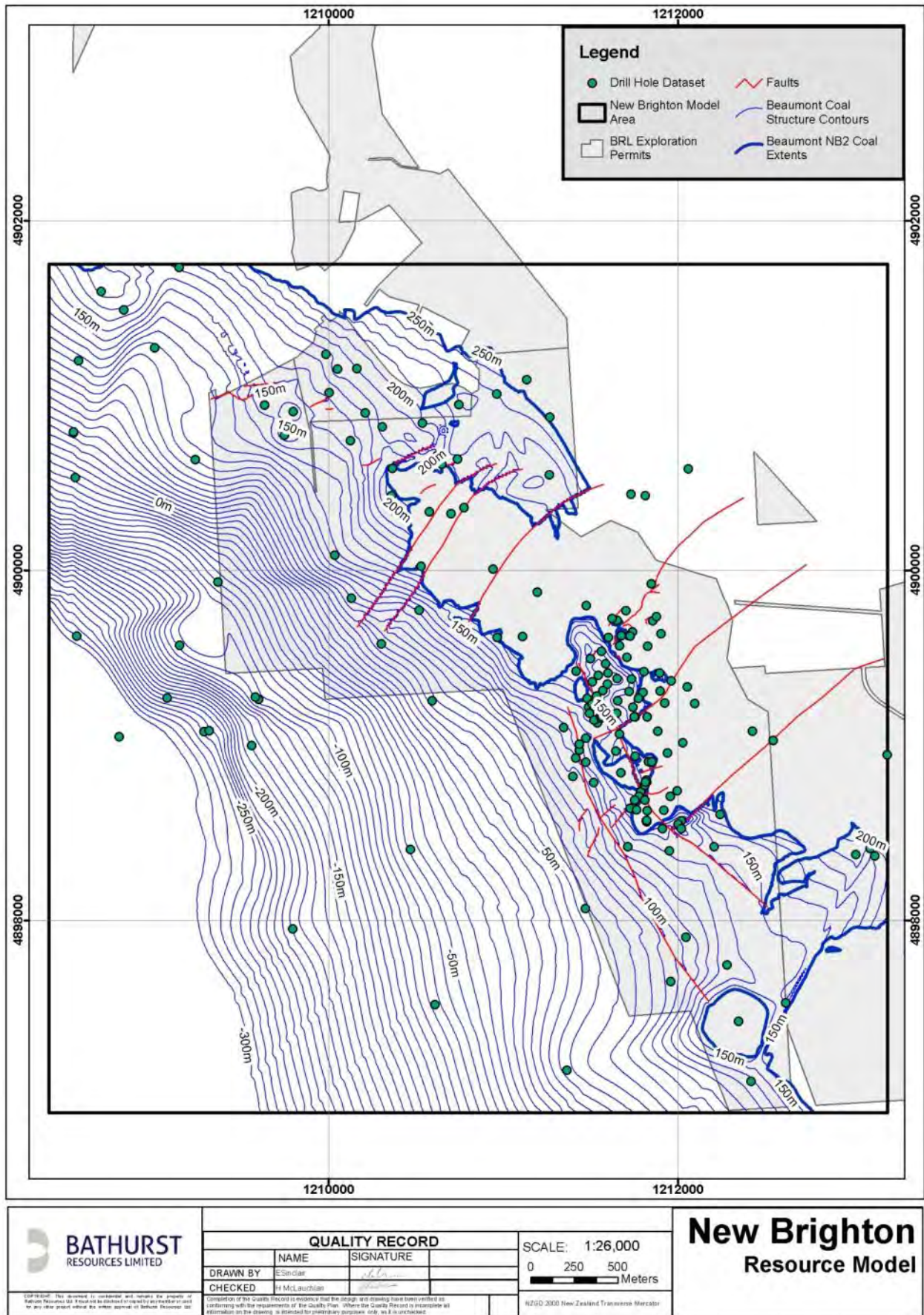
**Figure 5  Beaumont Formation Coal Floor Contours**
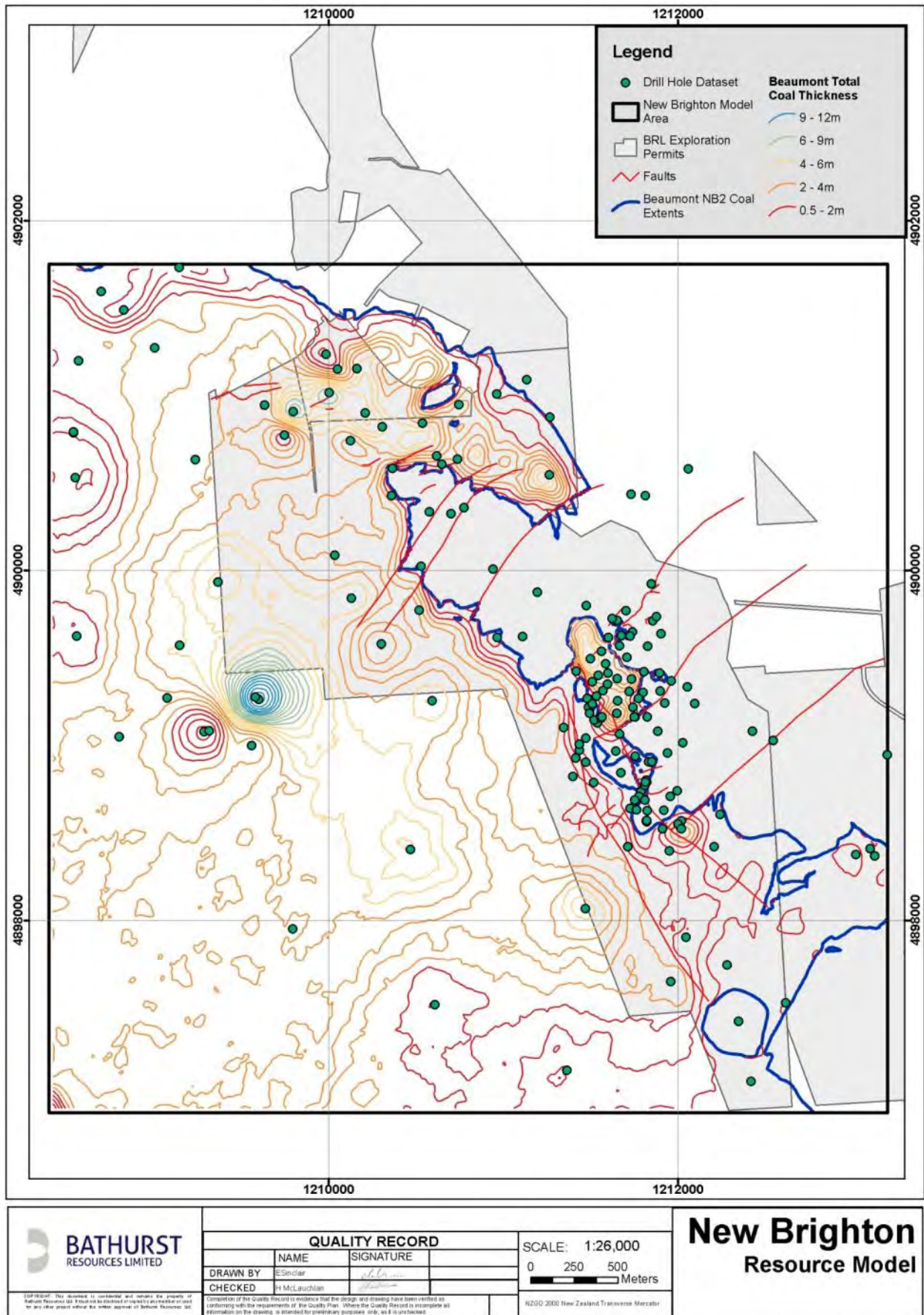
**Figure 6  Beaumont Formation Full Seam Cumulative Thickness Isopachs**
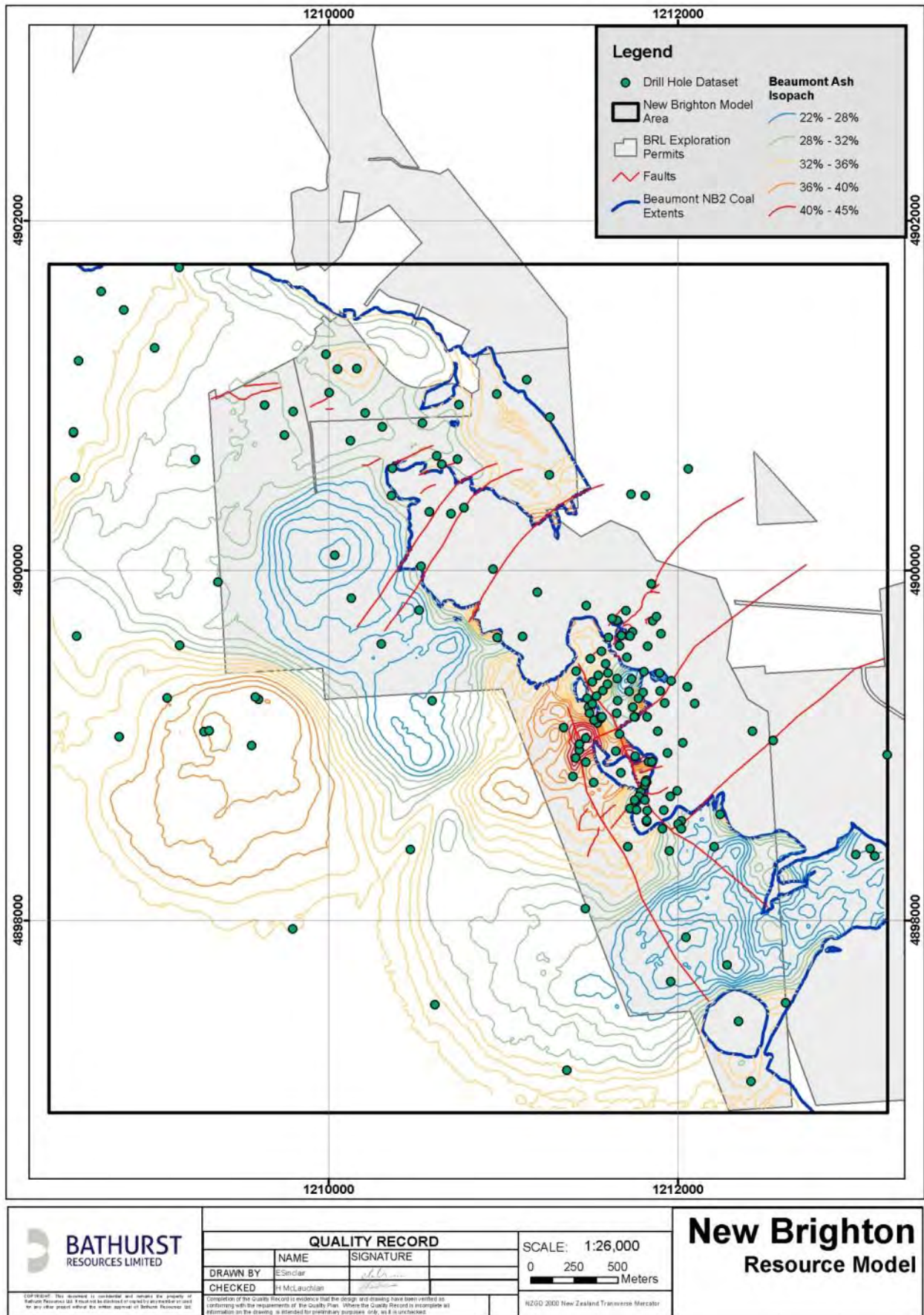
**Figure 7 Beaumont Formation Full Seam Ash Isopachs**
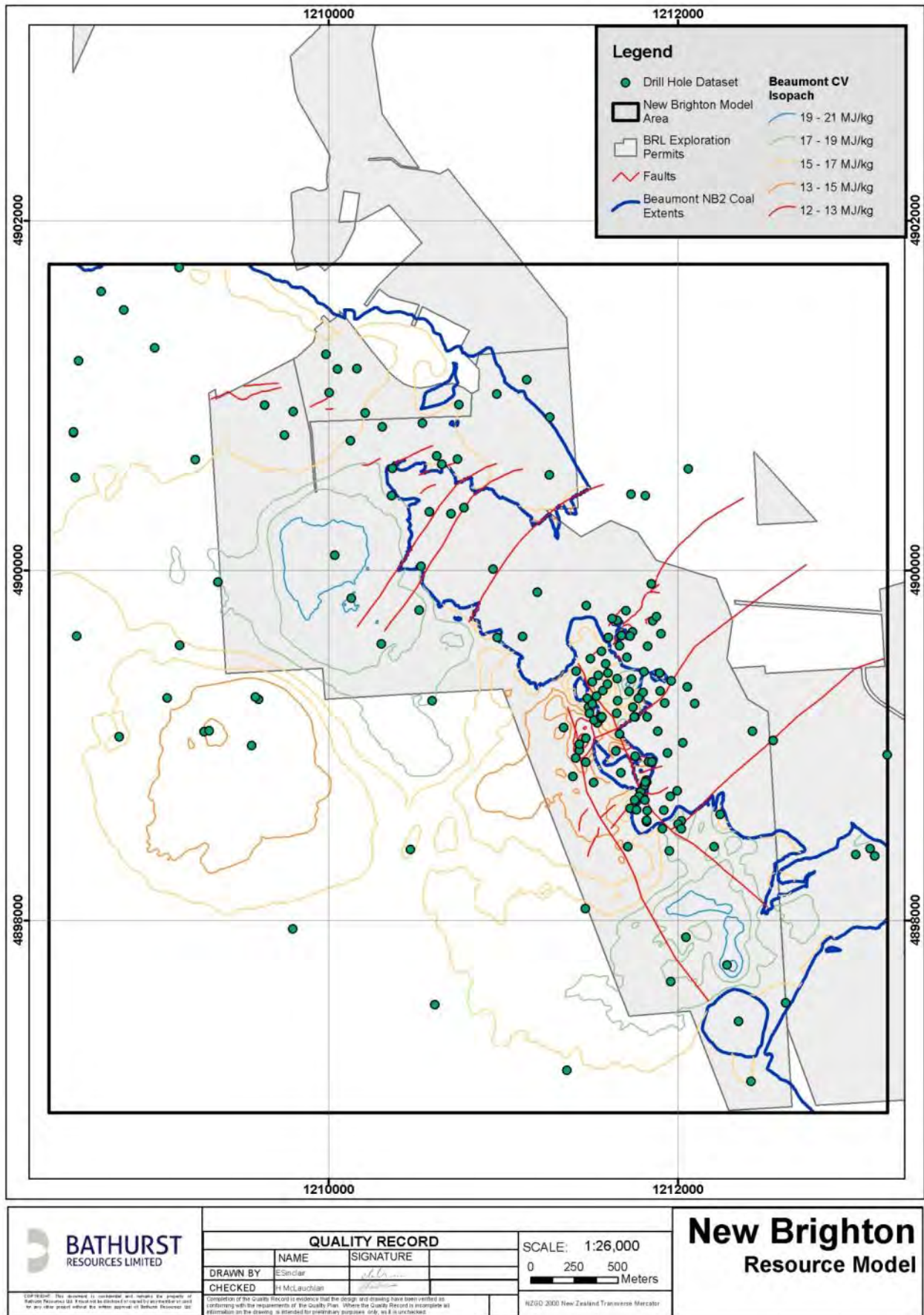
**Figure 8  Beaumont Formation Full Seam Calorific Value Isopachs**
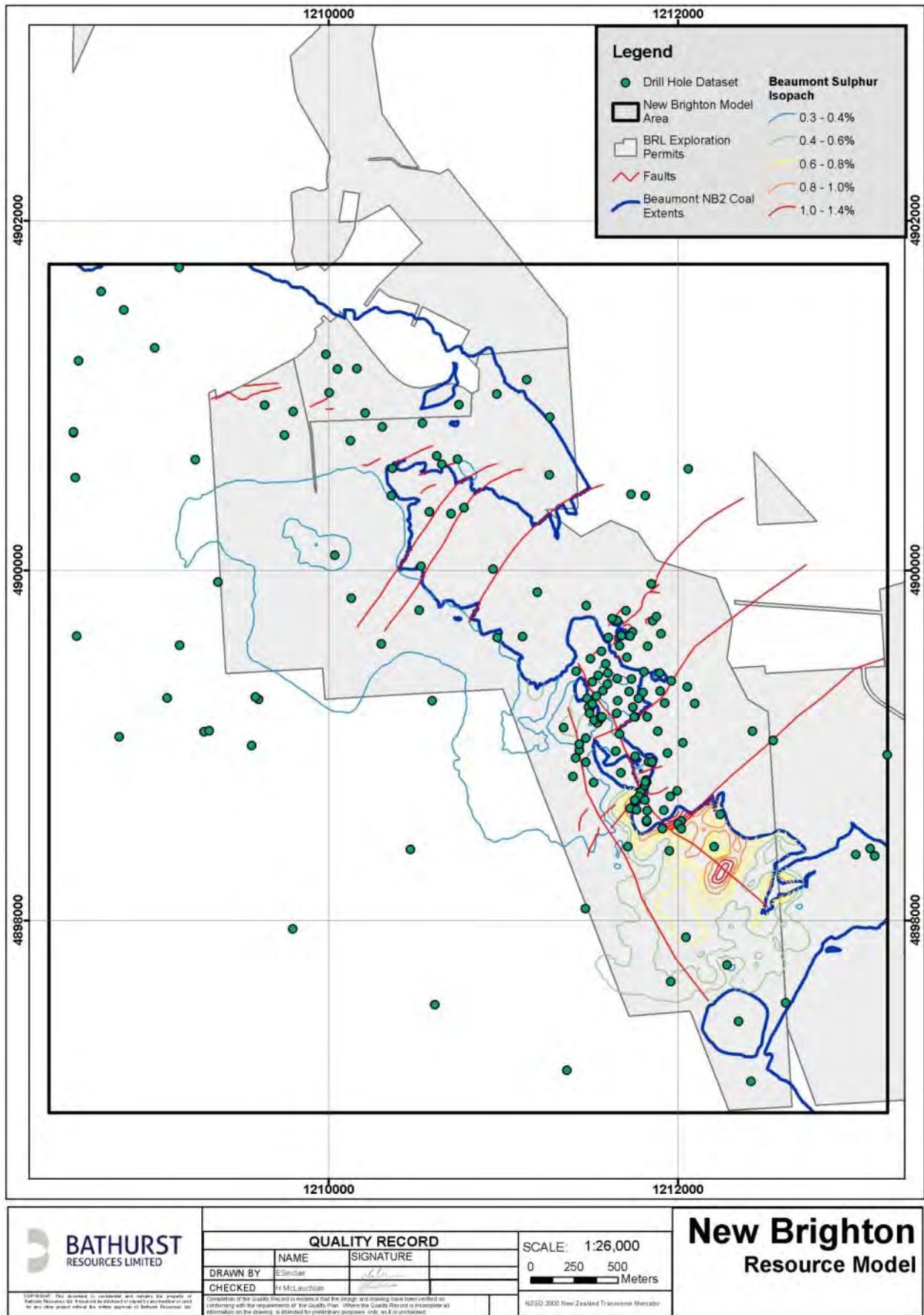
**Figure 9  Beaumont Formation Full Seam Sulphur Isopachs**
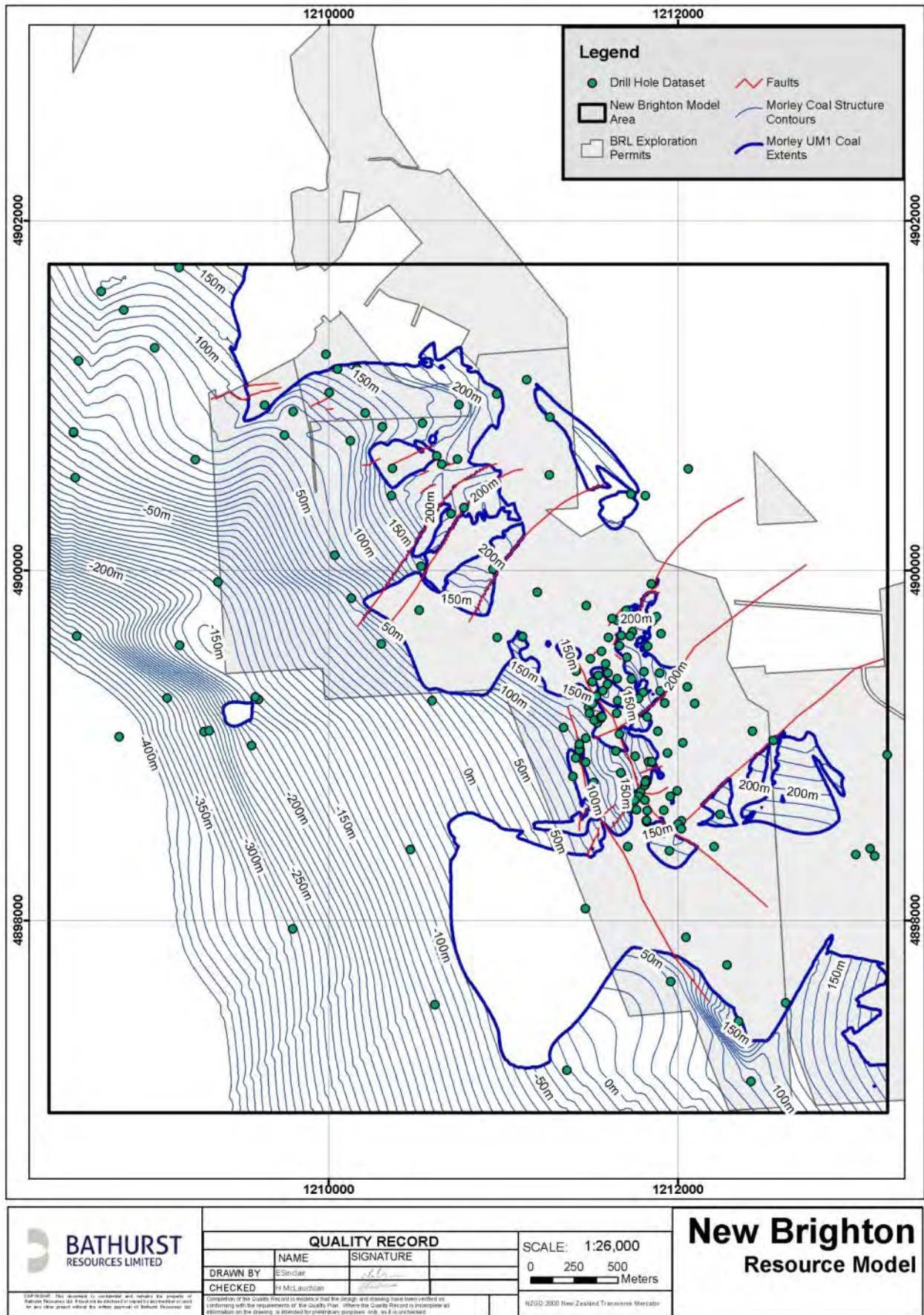
**Figure 10 Morley UM1 Seam Coal Floor Contours**
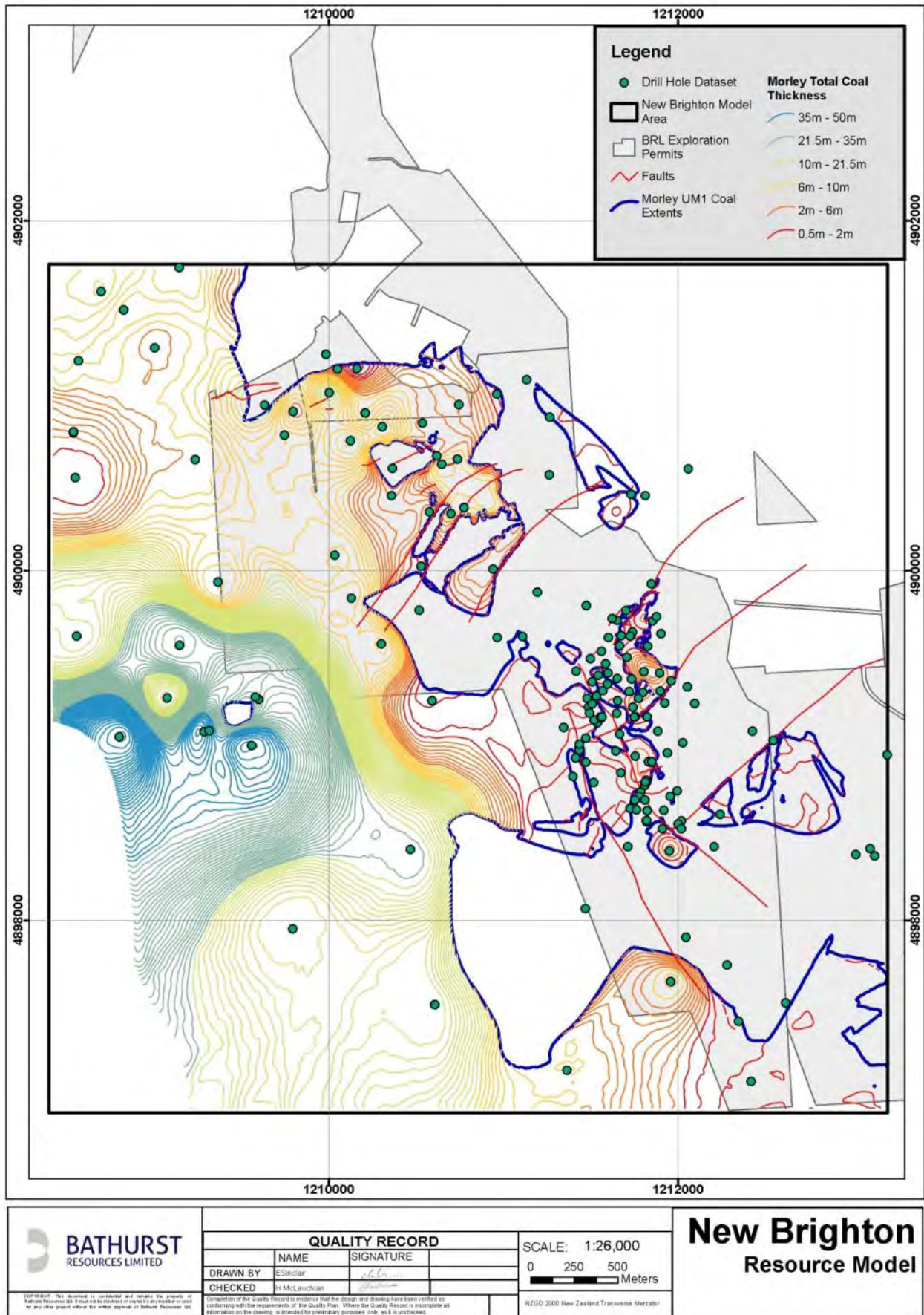
**Figure 11  Morley Formation Full Seam Cumulative Coal Thickness Isopachs**
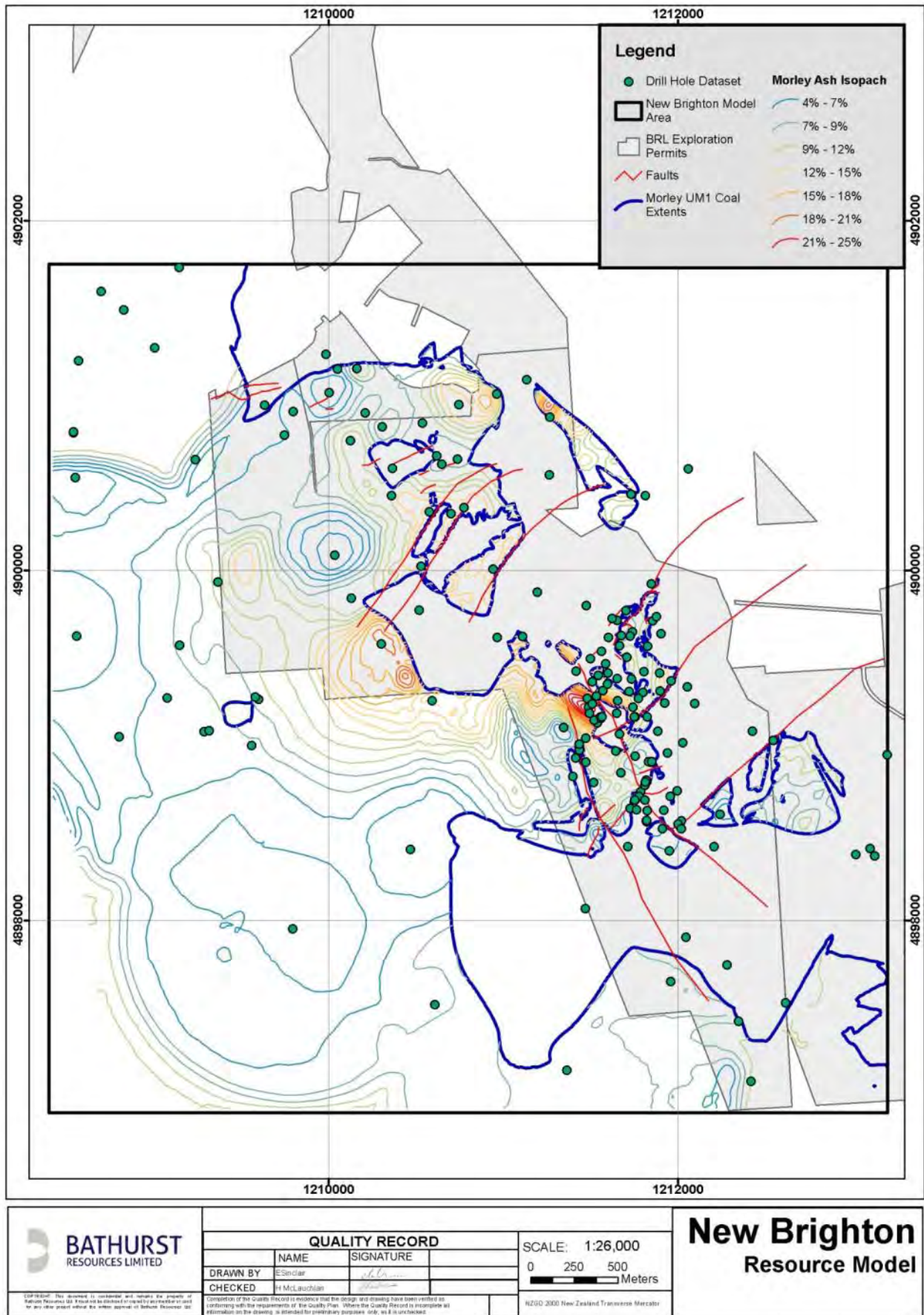
**Figure 12  Morley Formation Full Seam Ash Isopachs**
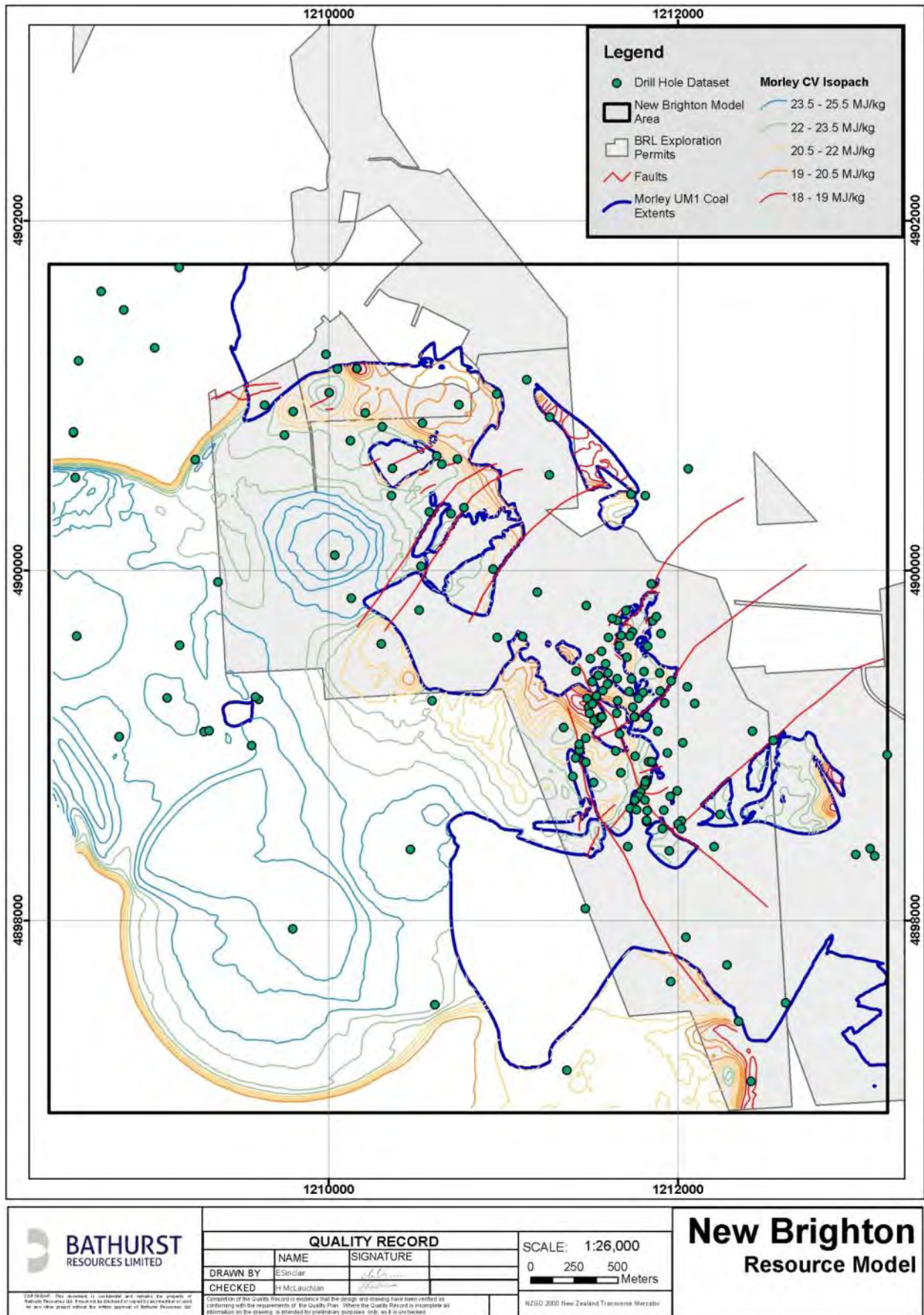
**Figure 13 Morley Formation Full Seam Calorific Value Isopachs**
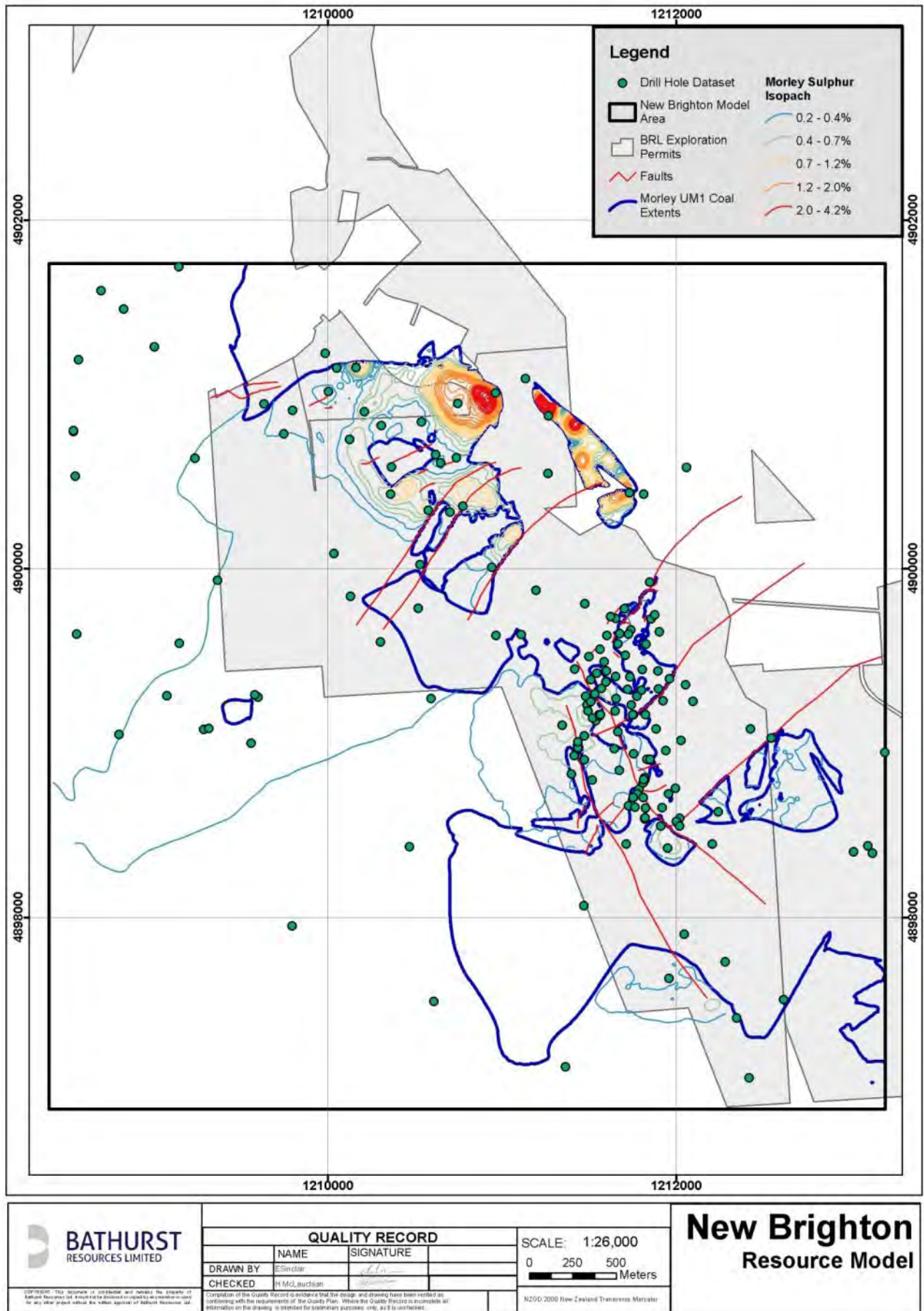
**Figure 14  Morley Formation Full Seam Sulphur Isopachs**

**Figure 15 New Brighton (ON1 Seam) Coal Floor Contours**

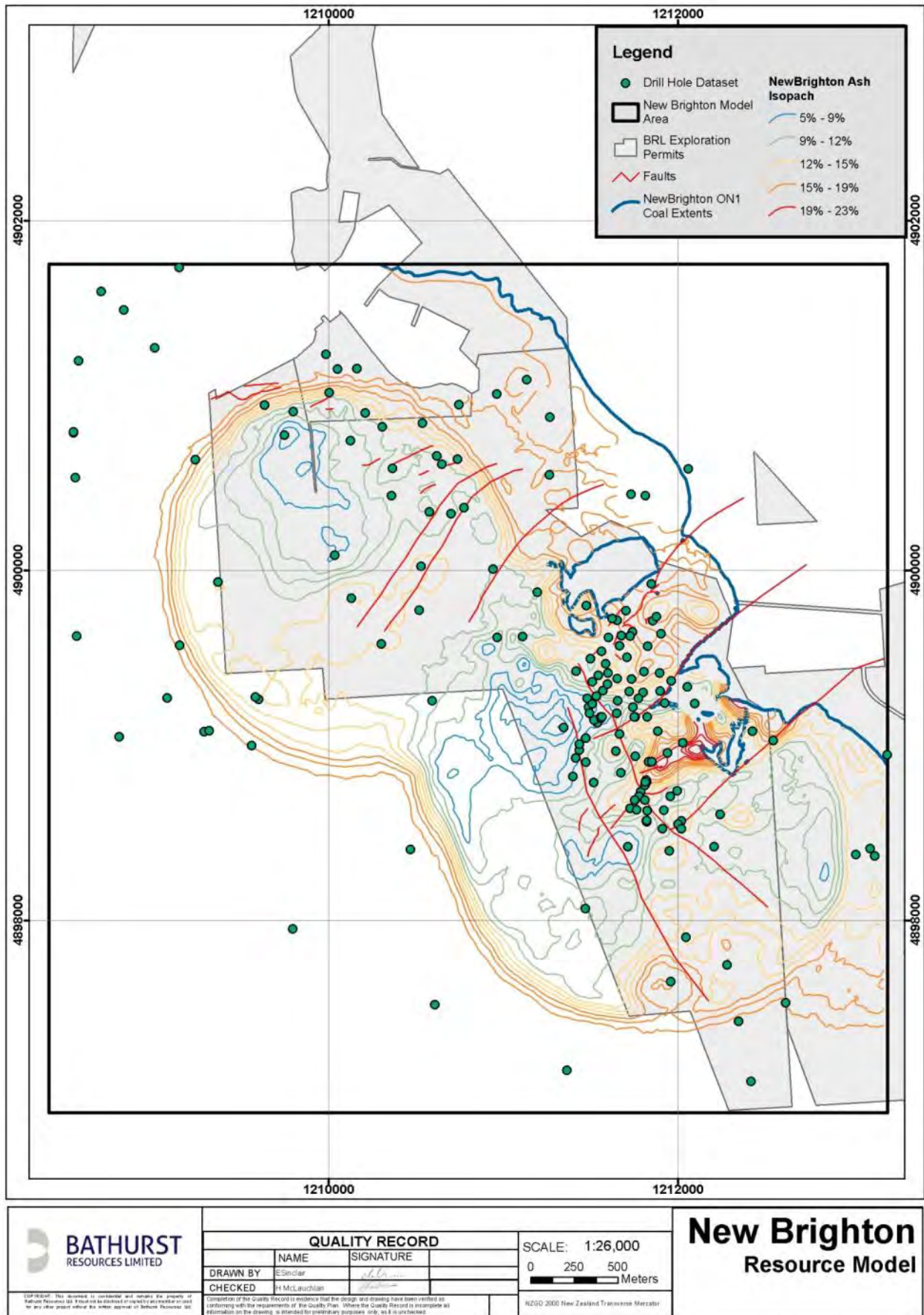**Figure 16  New Brighton Formation Cumulative Coal Thickness Isopachs**

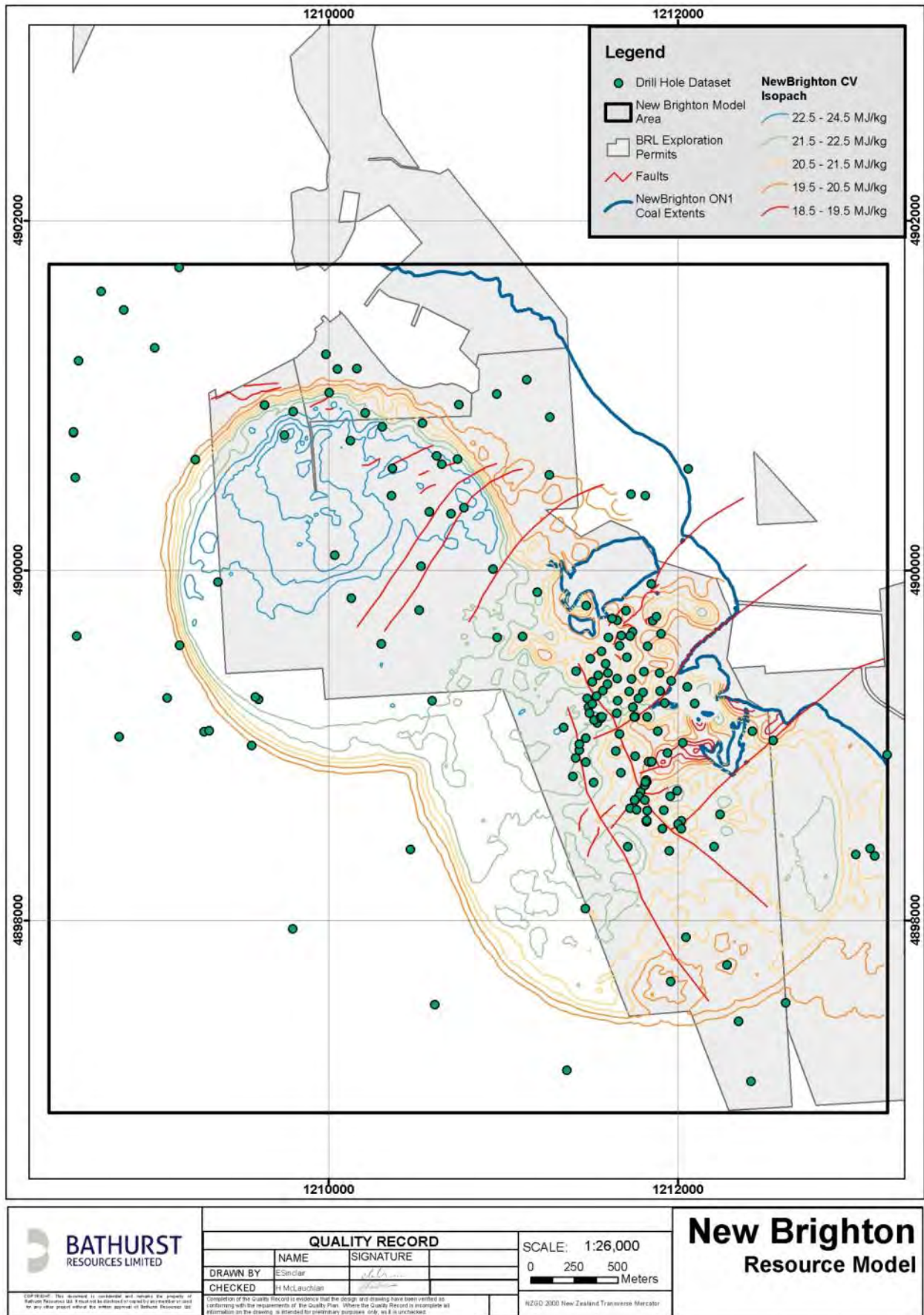**Figure 17  New Brighton Formation Full Seam Ash Isopachs**

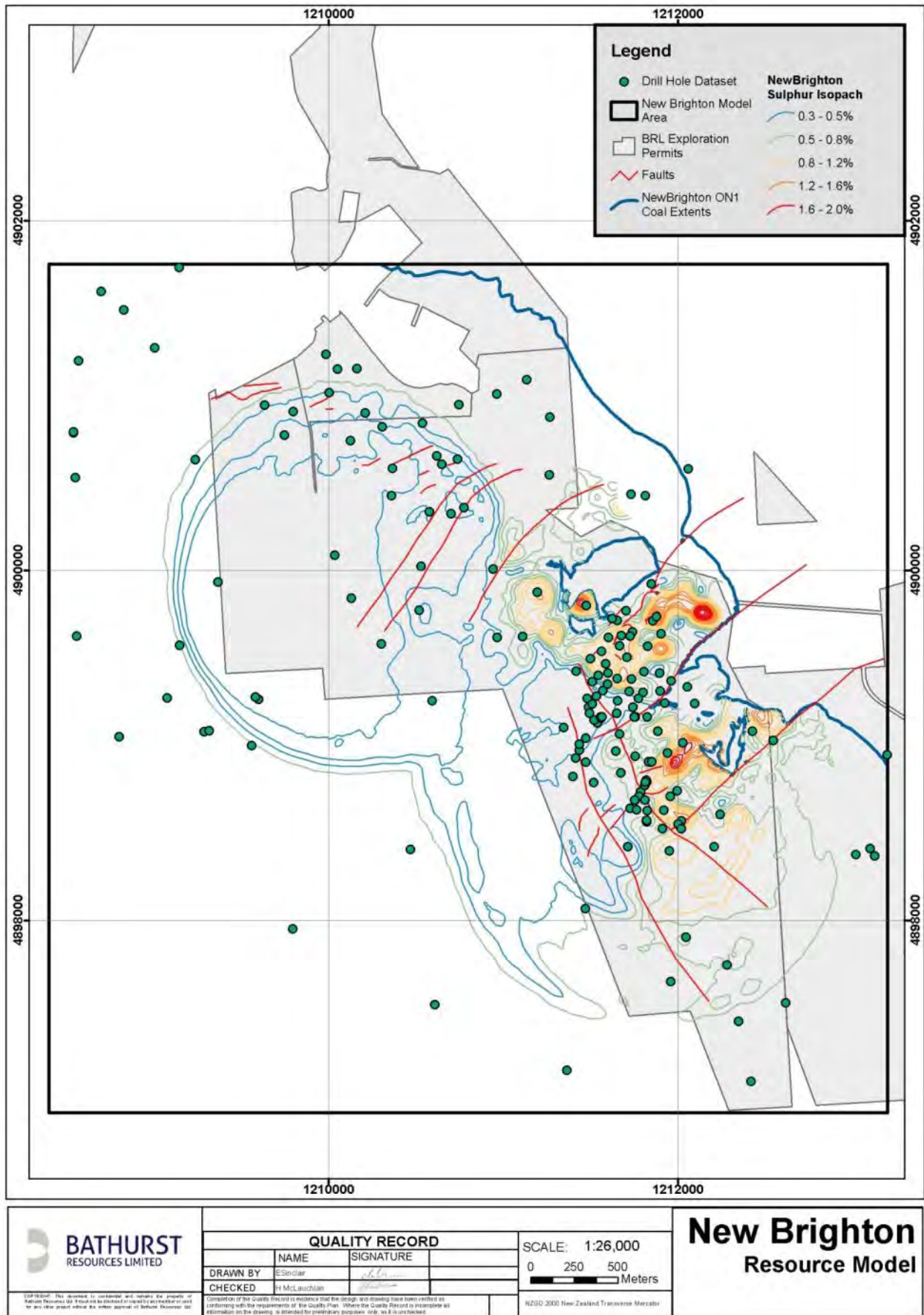**Figure 18 New Brighton Formation Full Seam Calorific Value Isopachs**

**Figure 19  New Brighton Formation Full Seam Sulphur Isopachs**