Jellinbah Group

Lake Vermont Extension Project – Initial Development Plan

Bowen Basin Coal Pty Ltd
July 2024

Supporting information to Lake Vermont Extension Project – Mining Lease Application

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Appendix 1 – CSG Assessment Criteria

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Table 1. Legislative Requirements of the IDP

Legislative requirement – relevant to proposed IDP	Short Description	This Document's Reference
Section 318DT(1)(a)	An overview of the activities proposed to be carried out under the proposed mining lease during all its proposed term.	Section 2
Section 318DT(1)(b)(i)	The nature and extent of activities proposed to be carried out under the proposed mining lease during the year	Section 22
Section 318DT(1)(b)(ii)	Where the activities are proposed to be carried out	Section 8.3
Section 318DT(1)(c)(i)	The location and an estimate of the resources of the mineral in all the area, or proposed area, of the proposed mining lease	Section 24
Section 318DT(1)(c)(ii)	The standards and procedures used to make the estimate	Section 10 and Appendix 2
Section 318DT(1)(c)(iii)	The rate and amount of the proposed mining	Section 12
Section 318DT(1)(c)(iv)	Approximately when the proposed mining is to start	Section 12.1
Section 318DT(1)(c)(v)	A schedule for the proposed mining during the plan period	Section 12.2
245(1)(o)(iii)(B)	Infrastructure	Section 3.4
318DT(1)(d)	Maps that show the matters mentioned in paragraphs (b) and (c)(i), (iii) and (iv)	Section 12
Section 318DT(1)(E)	Any other information relevant to the criteria mentioned in section 318EF of the MRA (i.e. the criteria for deciding whether to approve proposed plan)	Section 20
Section 318DT(1)(f)	Reasons why the plan is considered appropriate	Section 13
Section 318DT(1)(g)	Others matters prescribed under a regulation	Section 20
Section 318DV	Statement of how the effects on, and the interests of, any relevant overlapping or adjacent petroleum tenure holder have, or have not, been considered having regard to: - the main purposes of chapter 8 (Provisions for coal seam gas) of the MRA - the CSG assessment criteria, other than the initial development plan requirements.	Section 17 and Appendix 1
Section 318DW	The activities provided for under the proposed plan must seek to optimise the use of incidental coal seam gas in a safe and efficient way if it is commercially and technically feasible to do so.	Section 18
Section 318DX	Consistency with petroleum lease development plan and coordination arrangement	Section 19.1

1. OVERVIEW

Bowen Basin Coal Pty Ltd (Bowen Basin Coal) (ACN 065 321 440) is the 100% applicant of the Lake Vermont Extension Project Mining Lease Application (MLA). Bowen Basin Coal is a private company owned by the Lake Vermont Joint Venture (LVJV), an unincorporated Australian Joint Venture (JV) operating in Queensland comprising QCMM (Lake Vermont Holdings Pty Ltd (70%), Marubeni Resources Development Pty Ltd (10%), CHR Vermont Pty Ltd (10%) and Coranar (Australia) Pty Ltd (10%). The LVJV participants support Bowen Basin Coal as the applicant for the Lake Vermont Extension Project MLA.

The following Initial Development Plan (IDP) supports the applicant's Lake Vermont Extension Project MLA which is located within the Isaac Regional Council in Central Queensland, approximately 25km north-east of Dysart and 240km west of Mackay (Figure 1).

The Lake Vermont Extension Project is an extension to the immediate north of the existing Lake Vermont Mine, which operates within MLs 70331, 70477 and 70528 under Environmental Authority EPML00659513 (Figure 1). The existing Lake Vermont Mine extracts approximately 11.5 to 12Mtpa of ROM coal, producing approximately 9Mtpa of product coal. Production levels from the Lake Vermont Mine have been steadily declining since 2021.

Bowen Basin Coal's Lake Vermont Extension Project (The Project) is proposed to provide additional product coal to help augment the reduced open cut output from the existing Lake Vermont Mine. The objective of the Project is to help maintain production levels at approximately 9Mtpa for an estimated 20-year term to continue to service Bowen Basin Coal's existing customer base. Following the sustained 20-year term production plan, the operator plans to continue coal production in the extension area until the end of mine life. Following ML grant, the Lake Vermont Mine and the sought Lake Vermont Extension Area will collectively be known as the 'Lake Vermont Complex'.

The Project is ideally positioned to efficiently meet the market demands for metallurgical coal, having access to the Lake Vermont Mine's existing infrastructure and customer base. The Project will maximise the use of this existing infrastructure to minimise environmental impacts from additional infrastructure including the Lake Vermont Mine Coal Handling and Preparation Plant (CHPP), coal handling facilities, train loadout facilities, product coal stockpiles, co-disposal coal reject facilities and other supporting infrastructure.

The applicant respectfully seeks a term of 25 years for the MLA, with the sought term of the IDP being five years. During the IDP term, the applicant proposes to achieve the following activities for the Project MLA:

- completion of site preparation;
- construction of infrastructure; and
- commencement of production of the Lake Vermont Extension Project.

The scope of this IDP is based on the *Mineral Resources Act 1989* (Qld) (MRA) and the Department of Resources' (DoR) '*Initial and later development plan guideline'* (2023).

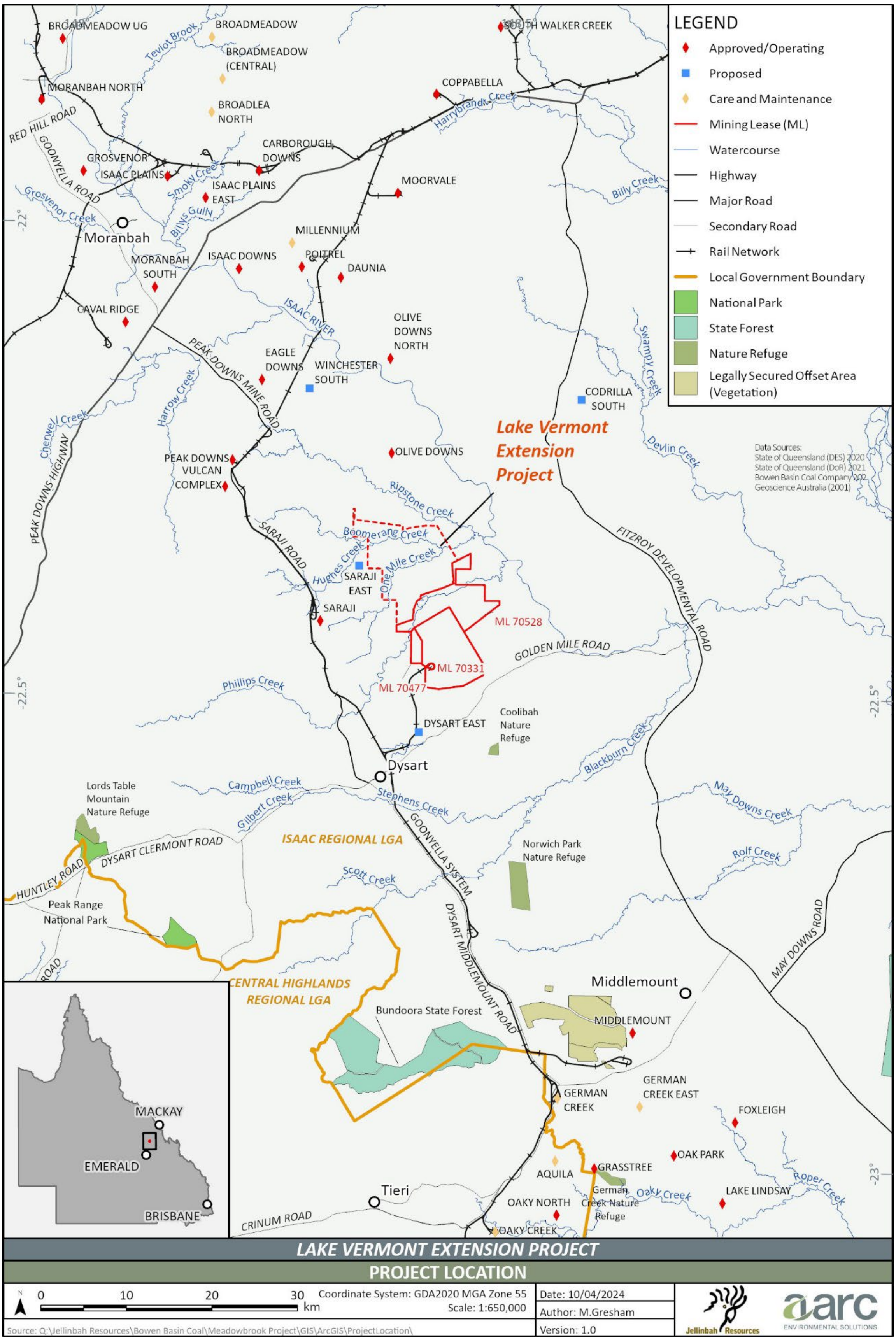

Figure 1. Lake Vermont Extension Project Location

2. OVERVIEW OF ACTIVITIES DURING THE TERM OF THE ML

The planned activities during the sought ML term of 25 years are designed to support the sustained production of approximately 9Mtpa of product coal from the Lake Vermont Complex (comprising the existing Lake Vermont Mine and the sought Lake Vermont Extension Project) to the mine's existing customer base (i.e. no increase in annual tonnage is proposed from the Lake Vermont Complex as a whole).

To achieve this objective, the activities associated with the Project during the sought ML term of 25 years are those associated with the preparation and development of underground single and dual-seam longwall mining, open cut mining activities, progressive rehabilitation and the development of supporting infrastructure including:

- an infrastructure corridor linking the new mining area to the existing Lake Vermont Mine infrastructure to help facilitate access, coal haulage, power and water supply and telecommunications infrastructure;
- a Mine Infrastructure Area (MIA) which will incorporate administration, operations buildings, fuel storage areas, equipment maintenance areas, hardstand areas, workshops, and associated facilities and services;
- underground portal, drifts and shafts for underground operations;
- boreholes to support the delivery of materials to the underground operations; and
- gas drainage bores and associated surface infrastructure.

The proposed overall arrangement (mine plan) for the Project is shown below in Figure 2. As discussed in Section 1, the applicant plans to use existing infrastructure and facilities at the Lake Vermont Mine wherever possible.

The primary targets of the underground component are the Vermont Lower Seam in the south of the MLA area and the Vermont Lower and Lower Leichhardt seams in the northern portion of the MLA area. The depth and thickness of the target coals in the MLA boundary provide for underground longwall mining as the most effective method of extraction. As indicated in Figure 2, where the resource is considered too shallow for underground mining methods (in an area adjacent to the existing Lake Vermont Mine), the applicant proposes to develop a small open cut 'satellite' pit which will use traditional truck and excavator methods.

The Project will produce a primary Low Vol HCC, a secondary Mid Vol PCI coal and a tertiary Industrial/Thermal coal (CV 5500 NAR) in a 69:22:9 ratio compared to the current Lake Vermont Open Cut operation which produces the same products in a 65:26:9 ratio. .

Mining within the open cut pit has been designed to minimise the disturbance associated with waste rock emplacements, with partial backfilling of the mined pit, supported by smaller out-of-pit waste rock emplacements. As a result of the planned predominantly underground mining operation, an estimated 562ha of the total sought MLA area of 8,238ha is estimated to be directly disturbed by the extension project.

The land within the MLA area, which is owned 100% by the MLA applicant, will be rehabilitated to achieve a post-mining land use. Rehabilitation will occur progressively during the mine life, in accordance with a Progressive Rehabilitation and Closure Plan (PRC Plan) which has been developed for the Lake Vermont Extension Project. Product coal will continue to be railed via the Goonyella Rail System to the RG Tanna Coal Terminal in Gladstone, the Abbot Point Coal Terminal in Bowen or Dalrymple Bay Coal Terminal in Mackay, for sale to export markets.

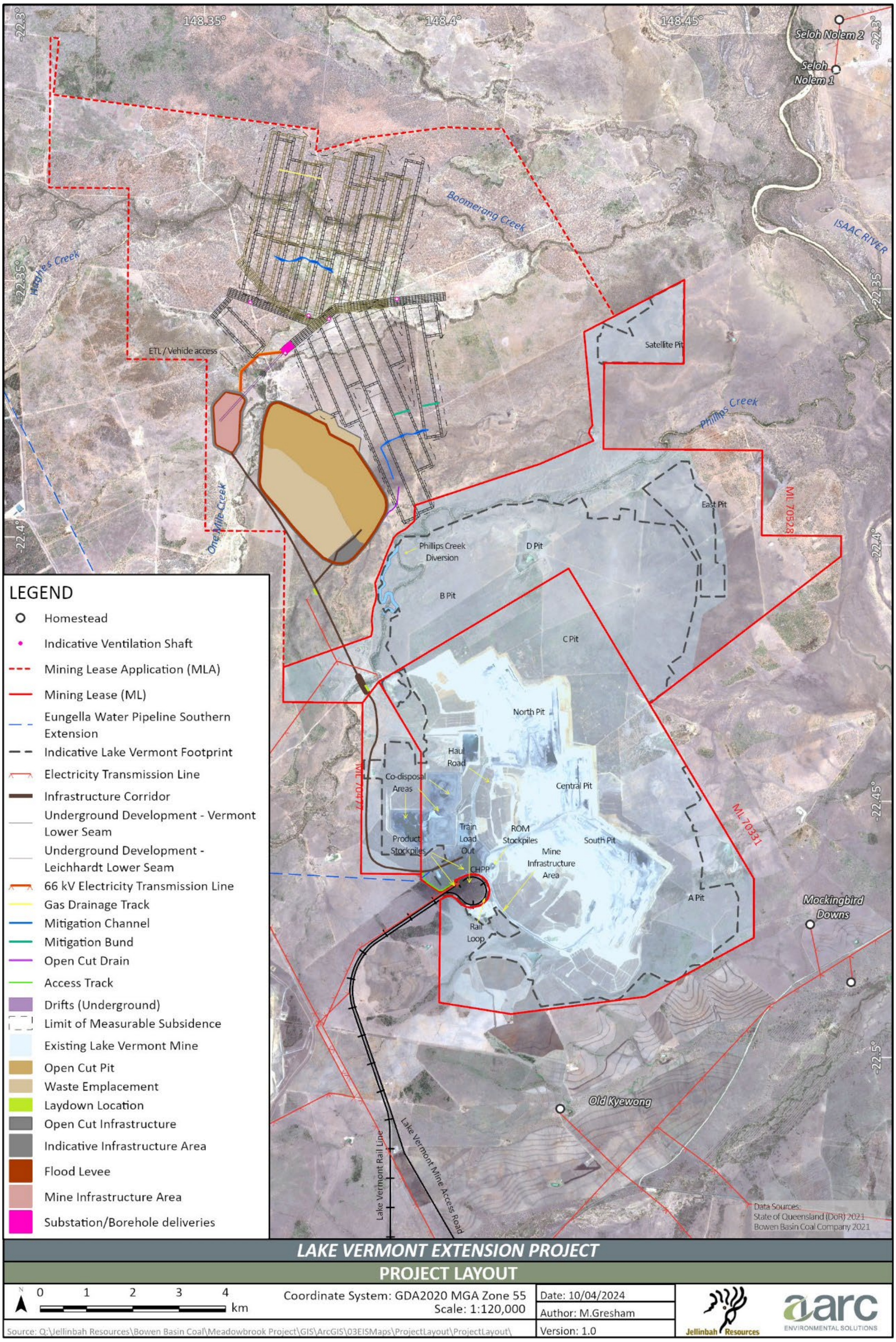

Figure 2. Lake Vermont Extension Project Mine Plan

2.1 ROM production

Figure 3 below shows the life of mine production profile for the Lake Vermont Complex (comprising the existing Lake Vermont Mine and the sought Lake Vermont Extension Project). As illustrated in Figure 3 below, the Project seeks to augment the reduced open cut output of the existing Lake Vermont Mine to help maintain production at current levels.

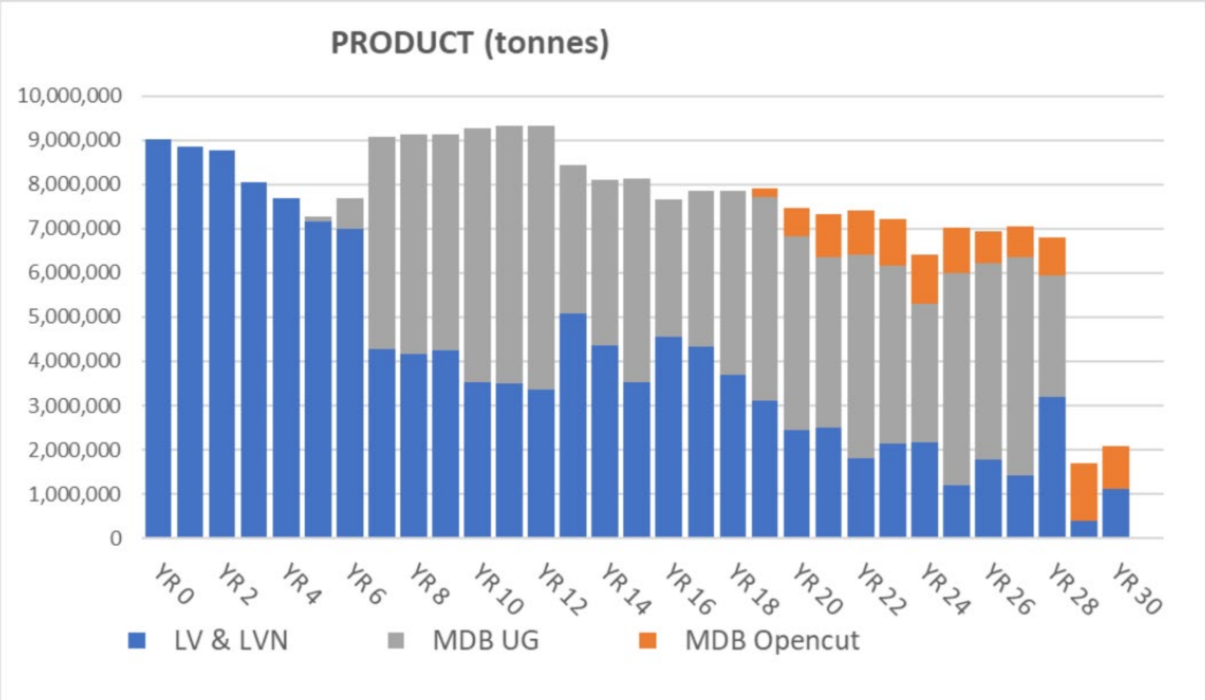

Figure 3. Lake Vermont Complex Life of Mine Production Profile

As the Project underground extension reaches its final years, the proposed open cut satellite pit is currently planned to commence in Project Year 22; further supplementing existing operations, with production levels continuing to tail off until Project mining completion (in Project Year 32). Final mining at the existing Lake Vermont Mine will occur for approximately six years following completion of the proposed Project, through the mining of the (already approved) Lake Vermont Mine open cut satellite pit. Figure 4 Figure 5 below show the LOM mining sequence for the Project underground and open cut extensions.

Table 2. LOM Production Schedule

Year	Underground Mining			Open Cut Mining (Satellite Pit)			
	ROM coal (t)	Product (t)	CHPP rejects (t)	ROM coal (t)	ROM waste (bcm)	Product (t)	CHPP rejects (t)
3	120,599	104,829	15,770	–	–	–	–
4	407,558	373,109	34,449	–	–	–	–
5	3,854,215	3,403,760	450,455	–	–	–	–
6	6,389,931	5,733,715	656,216	–	–	–	–
7	6,707,875	6,056,206	651,669	–	–	–	–
8	6,928,790	6,234,064	694,726	–	–	–	–
9	6,340,317	5,688,199	652,118	–	–	–	–
10	5,337,080	4,725,249	611,831	–	–	–	–
11	5,356,817	4,468,218	888,599	–	–	–	–
12	4,868,204	4,059,046	809,158	–	–	–	–
13	5,446,513	4,498,854	947,659	–	–	–	–
14	3,931,421	3,282,333	649,088	–	–	–	–
15	4,861,426	4,108,503	752,923	–	–	–	–
16	5,377,038	4,539,002	838,036	–	–	–	–
17	5,931,230	5,049,339	881,891	–	–	–	–
18	4,490,033	3,928,561	561,472	–	–	–	–
19	4,739,102	4,181,096	558,006	–	–	–	–
20	5,065,826	4,458,430	607,396	–	–	–	–
21	4,577,298	4,006,933	570,365	–	–	–	–
22	4,733,743	4,085,390	648,353	258,707	13,532,224	200,436	58,271
23	5,725,404	4,820,442	904,962	1,066,768	15,963,723	844,570	222,198
24	4,410,978	3,594,433	816,545	1,321,576	17,578,874	1,072,284	249,292
25	2,965,948	2,322,704	643,244	1,276,587	17,621,022	1,063,526	213,061
26	–	–	–	1,401,996	17,074,784	1,136,094	265,902
27	–	–	–	1,488,154	17,249,295	1,157,223	330,931
28	–	–	–	1,442,902	17,832,792	1,034,341	408,561
29	–	–	–	1,316,800	17,822,767	956,998	359,802
30	–	–	–	1,451,066	17,108,187	1,148,838	302,228
31	–	–	–	1,924,539	12,755,867	1,577,244	347,295
32	–	–	–	395,669	1,106,802	324,386	71,283
Total	108,567,347	93,722,417	14,844,931	13,344,763	165,646,337	10,515,939	2,828,824

The estimated quantities of products and wastes produced over the Project LOM are as follows:

- approximate total run of mine (ROM): 122Mt; and
- approximate total product coal: 104Mt.

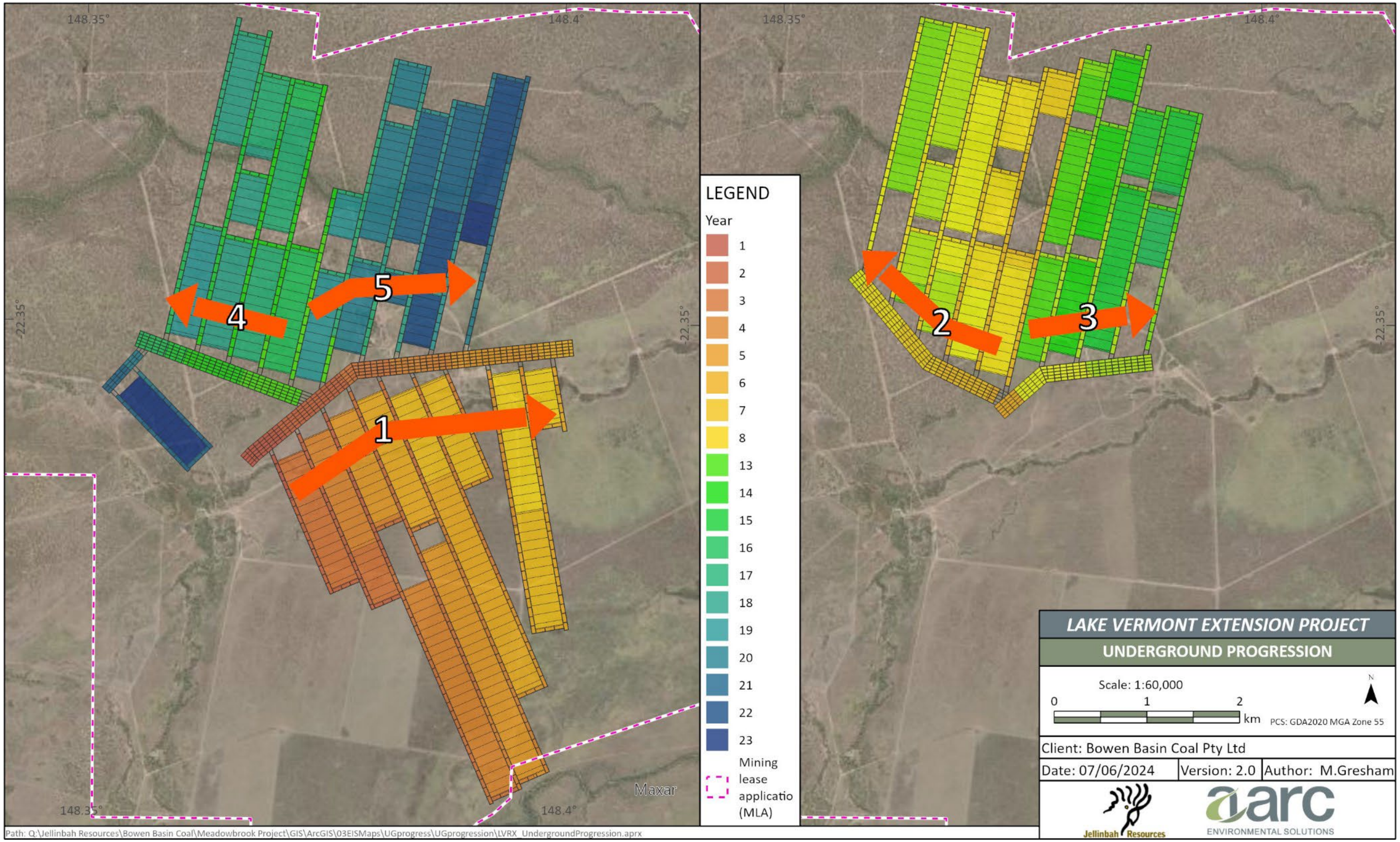

Figure 4. Lake Vermont Extension Project – LOM schedule (underground)

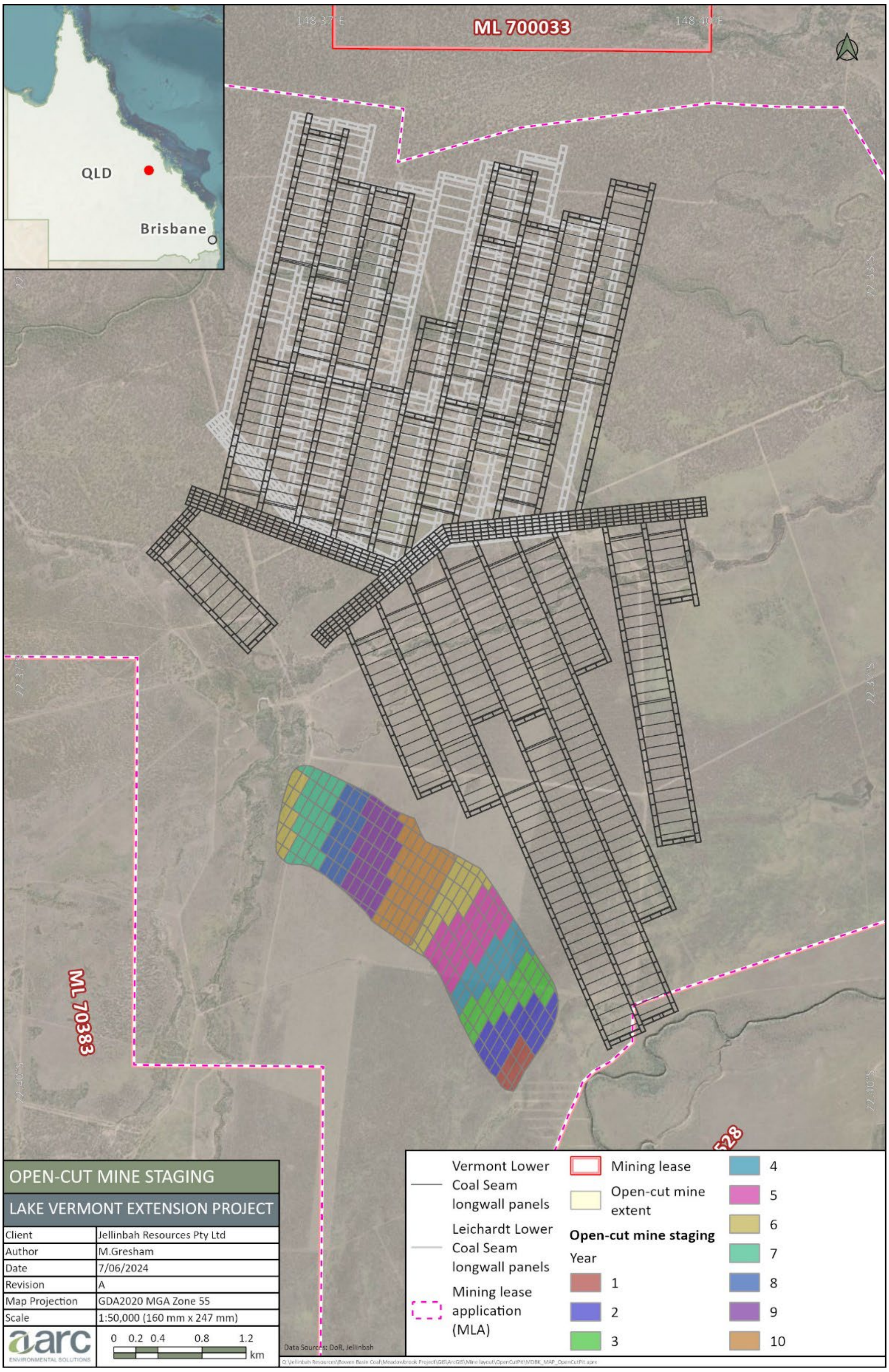

Figure 5. Lake Vermont Extension Project – LOM schedule (open cut satellite pit)

3. PROJECT CONSTRUCTION

As discussed above and as indicated above in Figure 2, the Project is designed to integrate with the existing Lake Vermont Mine infrastructure to maximise efficiencies and minimise environmental impacts. Key Project construction activities include the development of:

- an infrastructure corridor to provide for site access, coal haulage, power supply, water supply and telecommunications;
- a MIA;
- underground mine access portals, drifts and ventilation shaft and fans;
- ROM coal conveying and handling system;
- infrastructure for electricity supply;
- infrastructure for water supply; and
- mine water management infrastructure.

3.1 Infrastructure Corridor

An infrastructure corridor shown above in Figure 2 will be constructed to connect the Project MIA to the existing infrastructure at the currently operational Lake Vermont Mine. The infrastructure corridor will enable the delivery of electricity, water and telecommunications to the extension area, provide personnel and materials access, and facilitate the delivery of ROM coal to the ROM pad located at the Lake Vermont Mine. The infrastructure corridor is designed to include construction of the following:

- haulage road for personnel, materials and coal transport;
- watercourse crossings for Phillips Creek and One Mile Creek;
- an overhead 66kV electricity transmission line;
- a raw water supply pipeline;
- two laydown areas to support construction activities; and
- telecommunications infrastructure.

Various route options for the infrastructure corridor were assessed in consideration of safety, environmental and existing Lake Vermont Mine operational requirements. The proposed alignment of the infrastructure corridor forming this MLA was selected to minimise disturbance to remnant vegetation, impacts to Phillips Creek and One Mile Creek, and to allow for the integration of ROM coal haulage with the existing operations.

3.2 Access/Coal Haulage Roads

As indicated above in Figure 2, the primary external access to the Project site will be via the existing Lake Vermont Mine access road. This access will be used for personnel, equipment and material deliveries. Construction of the internal Project access/haulage road within the infrastructure corridor will be one of the first construction activities to commence to help facilitate the subsequent construction of the underground drifts and portal.

The internal Project access/haulage road will be a sealed bitumen road to support haulage of ROM coal from the MIA to the existing Lake Vermont Mine ROM stockpiles (via road-train). This sealed haul road will also facilitate access to the extension area for personnel and materials. The coal haulage road design will incorporate a loop at the MIA ROM coal stockpile area and a loop at the existing Lake Vermont ROM pad to facilitate ROM coal loading and unloading.

3.3 Stream Crossings

Construction of the access/coal haulage road will require stream crossings of Phillips Creek and One Mile Creek. The stream crossings will be constructed as causeways with appropriately sized culverts to pass flows.

3.4 MIA

Key components of the MIA are illustrated below in Figure 6**.** As indicated in Figure 6, a levy is proposed to be constructed around the perimeter of MIA for flood protection (1:1,000 AEP including protection of water ingress into the underground mine).

3.1 Underground Drifts and Portals

Several underground drifts and associated portals (providing the surface entrance to the underground drift tunnels) are proposed to be constructed. One drift will provide underground access for the transportation of personnel, mining equipment and materials whilst the other drift will house the main coal clearance conveyor to convey ROM coal from underground to the ROM coal stockpile located at the MIA.

Several surface in-seam (SIS) boreholes will also be developed for the purposes of providing key materials to the underground (e.g. concrete supplies, stone dust, etc).

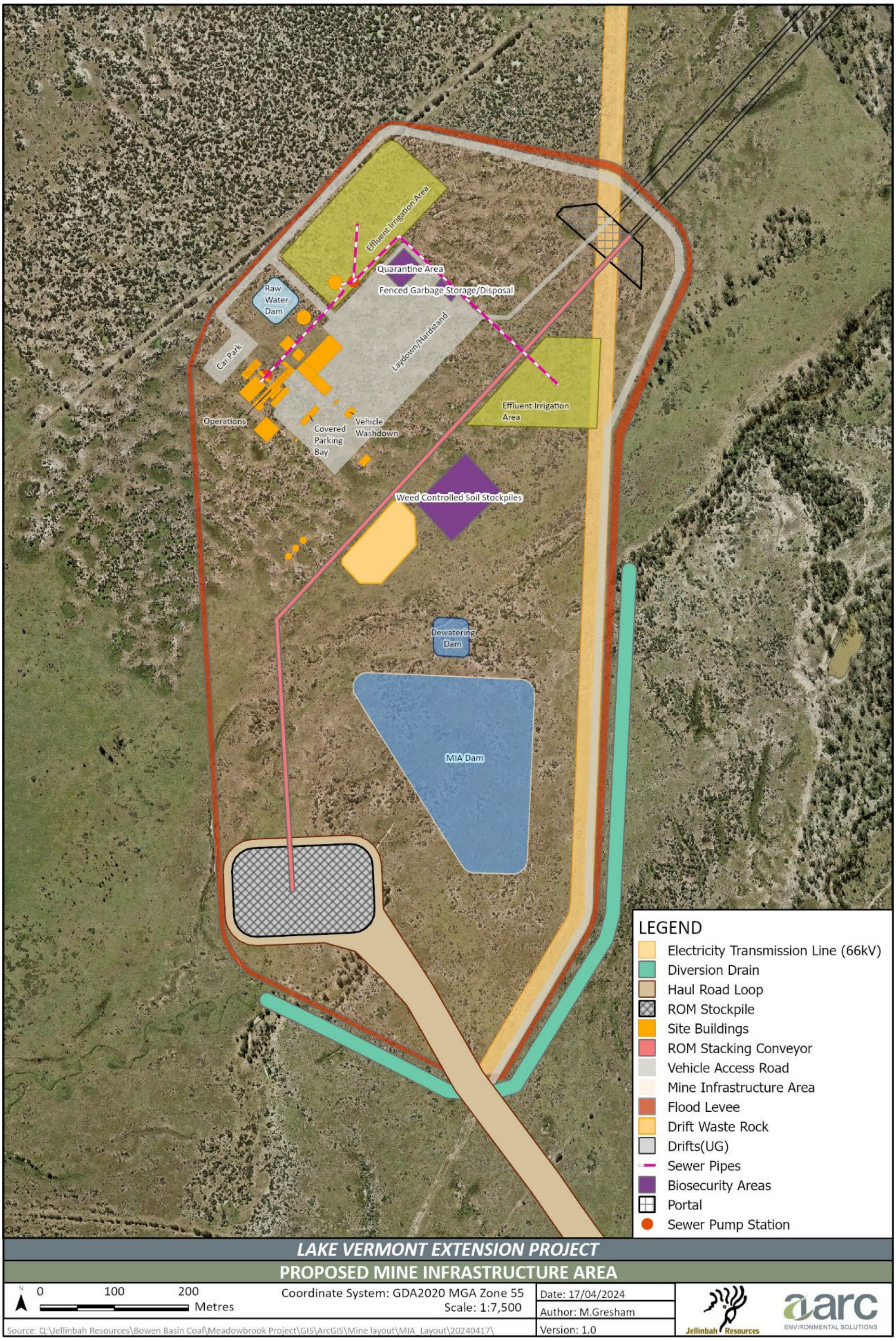
Effluent Irrigation Area
Quarantine Area
Fenced Garbage Storage/Disposal
Raw Water Dam
Car Park
Laydown/Hardstand
Effluent Irrigation Area
Operations
Covered Parking Bay
Vehicle Washdown
Weed Controlled Soil Stockpiles
Dewatering Dam
MIA Dam
LEGEND
Electricity Transmission Line (66kV)
Diversion Drain
Haul Road Loop
ROM Stockpile
Site Buildings
ROM Stacking Conveyor
Vehicle Access Road
Mine Infrastructure Area
Flood Levee
Drift Waste Rock
Drifts(UG)
Sewer Pipes
Biosecurity Areas
Portal
Sewer Pump Station
LAKE VERMONT EXTENSION PROJECT
PROPOSED MINE INFRASTRUCTURE AREA
0 100 200 Metres
Coordinate System: GDA2020 MGA Zone 55
Scale: 1:7,500
Date: 17/04/2024
Author: M.Gresham
Version: 1.0
Source: Q:\Jellinbah Resources\Bowen Basin Coal\Meadowbrook Project\GIS\ArcGIS\Mine layout\MIA_Layout\20240417\
Jellinbah Resources
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Figure 6. MIA

3.2 Ventilation Systems

An upcast ventilation shaft will be sunk to intersect the pit bottom area at a depth of approximately 240m. The shaft will be sunk using blind bore technology and will be concrete-lined and constructed in parallel with the drift construction.

The main mine ventilation fans will be positioned on the shaft collar and will provide a ventilation capacity of approximately 250m^3/s. The fans will be commissioned once an initial pit bottom underground roadway is driven to link the drifts to the base of the shaft. The pit bottom shaft and fans will provide sufficient ventilation capacity for the initial years of in-seam development and early longwall operation. Additional ventilation shafts will be sunk, and fan relocations will occur during the life of the underground mine to ensure adequate ventilation is maintained.

3.3 Electricity Supply Infrastructure

The Lake Vermont Mine is connected to the Dysart substation via a 66kV Electricity Transmission Line (ETL). The Ergon Energy Vermont substation is located adjacent to Lake Vermont Mine's MIA (adjacent to the CHPP).

A 66kV ETL is planned to be constructed within the infrastructure corridor and will distribute electricity to all mine infrastructure via the main 66/11kV substation. The MIA will be supplied via an 11kV ETL which will be underslung on the incoming 66kV ETL.

The main ventilation fans will be supplied via an underground 11kV cable from the main substation, with separate supply cables to each fan being distributed from the fan substation. The underground workings will be supplied electricity via 11kV cables down two SIS boreholes.

3.4 Fuel Supply

A diesel storage facility capable of storing up to approximately 120kL will be established at the MIA for the refuelling of mining support and transport vehicles. All fuel storage facilities will be constructed and operated in accordance with Australian Standard (AS) 1940: The Storage and Handling of Flammable and Combustible Liquids. Diesel will be transported to site by road tanker from Moranbah or Mackay.

3.5 Telecommunications

Telecommunications for the Project will be provided by an extension of the existing communications systems at the Lake Vermont Mine (either fibre optic or microwave telecommunications cable which will be co-located with the proposed water and power infrastructure).

An existing telecommunications tower is located at the existing Lake Vermont Mine, with a further telecommunications tower anticipated to be constructed within the proposed MIA.

3.6 Raw Water Supply Pipeline

A raw water supply pipeline will be constructed within the infrastructure corridor, co-located with the ETL easement to connect to the existing raw water supply pipeline at the Lake Vermont Mine that sources water from the Eungella Water Pipeline Southern Extension. The approximately 12km long raw water supply pipeline will transfer raw water to a Raw Water Dam at the MIA. Water demands for initial construction activity will be met by the capture of incidental rainfall and runoff within the Project water management system.

3.7 Water Treatment Plant

A water treatment plant will be constructed at the MIA to provide potable water for the Project. Raw water will be pumped from the Raw Water Dam to the water treatment plant for treatment. Treated water will be stored in 100kL capacity potable water tanks adjacent to the plant. Effluent from the water treatment plant will be captured and stored in a Mine Water Dam and used for dust suppression. During construction and until the water treatment facility (and raw water supply pipeline) is operational, potable water will be trucked to site by a local potable water supplier.

3.8 Sewage Treatment

During the construction phase, septic tanks will be used which will be routinely transported off-site to a local council sewage treatment plant. The waste sludge is expected to be removed every 12 to 18 months by a regulated waste contractor for disposal at a licensed facility.

A Sewage Treatment Plant (STP) will be constructed within the MIA for operations.

3.9 Water Management Infrastructure

Water management infrastructure proposed to be developed during Project construction includes the Raw Water Dam, the Dewatering Dam and the MIA Dam.

Water management infrastructure will also include levee construction around the perimeter of the MIA and the perimeter of the satellite open cut pit and waste rock emplacement footprint, for the purposes of flood protection and water management internal to these levee systems. Levy design Is based on protecting flooding impacts associated with a 1% AEP.

A pipeline from the Eungella Dam west of Eungella is connected to the Lake Vermont Mine (Eungella Water Pipeline Southern Extension).

3.10 Mine Dewatering

The proposed water management system has a designated storage for dewatering. Water may be pumped into the adjoining MIA Dam (for further dilution), used for dust suppression, or sent back to the Lake Vermont Mine to support processing requirements. Any excess water may also be stored within existing (approved) dam storages at the Lake Vermont Mine.

3.11 MIA and Open Cut Pit levees

The MIA and open cut pit are proposed to be protected by levee structures (0.1% AEP) supported by diversion drains to pass clean water around these disturbed areas. Three dams are proposed to be developed for the following reasons:

1. A Raw Water Dam is located within the MIA and will temporarily store raw water for use where relatively high-quality water is required. The Raw Water Dam would be sized to provide continuation of supply in the event of reasonably foreseeable equipment failure (e.g. pump or pipeline failure).
2. A Dewatering Dam will capture runoff in the MIA with store water transferred from the underground and open cut mining operations. Water from the Dewatering Dam will be pumped into the adjoining MIA Dam (for management or storage), used for dust suppression, or sent back to the Lake Vermont Mine to support processing requirements.
3. Three Sediment Dams are expected to be used during open cut mining operations to facilitate catchment runoff from overburden dumps will be captured in three sediment dams (Southern Sediment Dam, Northern Sediment Dam 1 and Northern Sediment Dam 2).

3.12 Construction Materials and Equipment

The Lake Vermont Extension Project will support local and regional suppliers and manufacturers where possible for construction materials and equipment. The indicative types of construction materials required for the Project include:

- bitumen;
- concrete;
- haul road base (gravel);
- pre-cast concrete structures;
- prefabricated buildings;
- structural steel and steel reinforcing;
- oversized special items; and
- other miscellaneous items.

Large items that cannot be divided into smaller components will be transported on State roads under permit via the Lake Vermont access road and infrastructure corridor access road. Where necessary, these vehicles will be accompanied by safety escorts. Equipment and fuel deliveries are anticipated to come from Moranbah or Mackay via Saraji Road and the Lake Vermont Mine access road.

The construction equipment fleet anticipated to be used during construction include excavators, haul trucks, dozers, drills, graders, scrapers, front-end loaders, cranes/frannas and water trucks. The initial underground mining equipment will also be delivered to the Project during the construction stage.

4. RAIL AND PORT INFRASTRUCTURE

The Lake Vermont Mine has an existing spur line and rail loop, branching off the Norwich Park Branch Railway (Goonyella Railway System). Product coal is railed to the RG Tanna Coal Terminal in Gladstone or Abbot Point Coal Terminal in Bowen for export. The Lake Vermont Mine also has the capability of railing coal to the Dalrymple Bay Coal Terminal in Mackay when opportunities permit.

As discussed above in Section 1, product coal from the Lake Vermont Extension Project will be railed via the Goonyella Rail System to the RG Tanna Coal Terminal in Gladstone, the Abbot Point Coal Terminal in Bowen or Dalrymple Bay Coal Terminal in Mackay, for sale to export markets.

5. WORKFORCE AND ACCOMMODATION

A currently estimated construction workforce of 250 personnel is expected during the Project construction phase (subject to change). The main workforce categories include:

- civil works;
- site buildings and infrastructure construction;
- drift and shaft construction; and
- equipment assembly.

Occupations represented in the construction workforce are likely to include:

- earthmoving and heavy equipment operators;
- structural steel and welding trades workers;
- professionals including geologists, project managers, safety officers, engineers and environmental scientists;
- carpenters, scaffolders and painting, plumbing and electrical trades workers;
- concreters; and
- construction, mine tunnelling and mining labourer.

Occupations required by the Project during operations are anticipated to include:

- underground heavy equipment operators;
- drillers;
- skilled tradespeople including boiler makers, electricians, special mechanics and diesel fitters;
- engineers, surveyors and geologists;
- health, safety, environment, human resources, and mine management professionals; and
- administrative staff.

The operational workforce for the Lake Vermont Mine Complex (i.e. operation of the existing Lake Vermont Mine and extension area) is estimated to be up to 860 workers (450 workers associated with open cut operations and 410 workers associated with planned underground operations).

5.1 Rostering

The Project construction activities will be undertaken in parallel with ongoing mining operations at the Lake Vermont Mine.

Throughout the construction and operations phase of the extension project, mining activities are likely to occur 24 hours a day, seven days a week; with surface construction activities being limited to the daytime.

5.2 Workforce Accommodation

The Lake Vermont Accommodation Village in Dysart provides accommodation for the existing Lake Vermont Mine workforce who do not live locally but choose to stay in the village during their rostered work. The accommodation village currently has 637 single accommodation units, and recreation and dining facilities located on site for guests.

The construction workforce for the Project will be accommodated in either the commercial Civeo accommodation village or Stayover (Ausco) accommodation villages in Dysart. A development application has been submitted to the IRC to increase the Lake Vermont Accommodation Village by 144 rooms. It is envisaged that these increased rooms may be used to accommodate the underground workers which do not choose to live locally.

6. MINE DEVELOPMENT

The proposed mine development for the Project underground and opencut extensions is provided above in Figure 4 and Figure 5.

6.1 Underground Mining Schedule and Sequencing

Coal reserves in the underground mining area will be mined over approximately 23 years. Mining is expected to commence in the Vermont Lower Seam in Project Year 3 following drift and shaft construction.

The development of the underground main headings and gate roads is anticipated to commence in Project Year 3 after construction of the drifts has been completed. Continuous miner units will be used to drive the in-seam access headings to enable longwall operations to commence. Approximately 22 months of initial in-seam development with continuous miners is planned before the longwall commences operation in Project Year 5.

The applicant currently plans to extract the southern longwall panels first; progressing from west to east. As the longwall completes the southern panels in the Lower Vermont Seam, in-seam development work will commence in the northern panels in the overlying Leichhardt Lower Seam. Access from the Vermont Lower Seam up to the Leichhardt Lower Seam will be via inter-seam drifts. Upon completing extraction of the southern Vermont Lower seam panels, the longwall will commence mining the northern Leichhardt Lower seam panels. Once the northern Leichhardt Lower seam panels have been extracted, mining will recommence in the Vermont Lower Seam to extract the northern Vermont Lower seam panels.

6.2 Open Cut Satellite Pit Schedule and Sequencing

As discussed above, the open cut satellite pit is located within MLA area and to the north of the existing Lake Vermont Mine approved operations. The open cut satellite pit will target coals of the Vermont Lower, Vermont and Leichhardt Seams.

The placement of the initial box cut and mine sequencing has been determined by the need to:

- use a terrace mining technique to manage the steep floor grades;
- locate the final landform depression outside of the floodplain; and
- minimise the haul distance to overburden dumps to reduce noise and air emissions.

Satellite pit extraction of the target Leichhardt Lower, Vermont and Vermont Lower Seams in the open cut satellite pit will be mined for approximately 11 years, starting in Project Year 22 and finishing in Project Year 32.

The open cut will be a terrace mining operation and will initially commence in the south and progress north to the centre of the mining area. Mining will then relocate and commence in the north and progress to the south. This mining sequence and associated back-filling will result in the final rehabilitated pit landform providing a post mining land use of grazing (consistent with the pre-mining land use). This progression also ensures that no ‘pit void’ is retained post mine closure.

6.3 ROM Coal Handling

ROM coal from the underground mining operations will be conveyed by the underground drift conveyor and surface stockpile conveyor directly to a ROM coal stockpile pad located at the MIA. ROM coal from the open cut mining operations later in the mine life will be hauled from the open cut pit to a ROM coal stockpile pad located at the top the southern pit ramp.

ROM coal will be loaded from the ROM coal stockpiles onto double or triple road trains by front end loader. Haulage will be via the sealed road to the existing Lake Vermont ROM pad. The ROM coal will be fed into one, or both, of the two existing CHPP ROM coal hoppers, noting that one hopper is located adjacent to each of the two existing CHPP modules. Dozers will be used in conjunction with the front-end loaders at the two ROM coal pads for management of the stockpiles.

6.4 ROM Coal Reclaim and Preparation

ROM coal reclaim and preparation will follow existing processes at the Lake Vermont Mine. The CHPP modules comprise a range of components including crushers, screens, dense medium cyclones, flotation cells, separators, filters and thickeners to process the coal and separate coal reject materials. The CHPP has two processing modules, having the capability to produce multiple product coals including hard coking and industrial/thermal coal.

The two CHPP modules, in tandem, can process a ROM coal feed of up to 11.2Mtpa, producing approximately 9Mtpa of product coal. No additional CHPP capacity is required to support the proposed Project, with the current authorised limit of 12Mtpa of ROM coal considered sufficient to support the proposed Project.

The Project will produce a primary Low Vol HCC, a secondary Mid Vol PCI coal and a tertiary Industrial/Thermal coal (CV 5500 NAR) in a 69:22:9 ratio compared to the current Lake Vermont Open Cut operation which produces the same products in a 65:26:9 ratio.

6.5 Product Coal Handling and Transport

Washed coal from the CHPP will be conveyed to the coal stockpiles located adjacent to the train load out facility. From the product coal stockpiles, coal is conveyed to the train load out bin. The train load out facility comprises a four valve reclaim tunnel and reclaim conveyor capable of dispatching coal from site at 4,250tph. No additional infrastructure or modifications to the existing product coal handling processes are required for the Project.

6.6 Reject Management

Coal reject management procedures used at the existing Lake Vermont Mine will continue for the Project. A co-disposal system (i.e. the simultaneous disposal of coarse and fine reject material) will continue to be used to manage rejects. Reject management will commence with the Project using existing, approved co-disposal cell capacity at the existing Lake Vermont Mine from Project Year 3. Future additional reject disposal capacity will also be available within approved residual voids at the Lake Vermont Mine. In-pit disposal of coal rejects may therefore be considered in future, subject to independent approvals.

7. ONGOING RESOURCE DEFINITION AND EXPLORATION ACTIVITIES

The Project resource has been defined through exploration drilling and seismic surveys. During the life of the Project, exploration activities will continue to be undertaken within Bowen Basin Coal Pty Ltd owned tenements. These exploration activities will likelyinclude in-seam drilling and surface-to-seam drilling to investigate geological structures, coal seam gas reservoir characteristics, coal quality and seam morphology.

8. NATURE AND EXTENT OF ACTIVITIES PROPOSED FOR THE IDP TERM

The following section describes the nature and extent of the activities proposed for each year of the IDP term. The below activities are provided according to the current mine plan as of June 2024. As indicated below, the nature and extent of activities are divided into the initial construction phase followed by the commencement of mining and production phase:

8.1 Construction and Mine Establishment Phase (Year 1 and Year 2)

- mobilise personnel and equipment to site for initial works;
- clear vegetation and strip topsoil and subsoil from the area for the construction build pad, temporary workshop and office and initial site roads;
- construct a pad and temporary workshop and office for the assembly of mining equipment;
- start assembly of construction and ancillary equipment;
- construct diversion drains and bunds to keep clean water off the site;
- construct drains, sumps, sedimentation ponds, and silt traps to manage water on the site;
- clear vegetation and strip topsoil and subsoil from the box cuts, ROM pad, initial waste rock dump, and haul road footprint;
- construction of the box cuts and drifts and ventilation shaft;
- SIS and gas drainage for pre-drainage of planned mining areas and further seam gas reservoir characterisation; and
- construct laydown pads, and haul roads.

8.2 Mining and Production Phase (Years 3 to 5)

- commission underground production equipment and ramp-up of mining activity;
- commence underground in-seam (UIS) mine development;
- construction of additional infrastructure required to commence longwall operations;
- UIS drilling for goaf gas drainage as required; and
- commence longwall operation.

Construction and establishment of surface infrastructure will occur in parallel with drift and shaft construction in Year 1 and Year 2. In-seam development of the mine will commence in Year 3. Longwall production is currently scheduled to commence Year 5. Table 3 below provides the estimated LOM for the IDP term.

Table 3. Indicative IDP term ROM

Year	Underground Mining			Open Cut Mining (Satellite Pit)			
	ROM coal (t)	Product (t)	CHPP rejects (t)	ROM coal (t)	ROM waste (bcm)	Product (t)	CHPP rejects (t)
1 & 2		0	0	0	0	0	0
3	120,599	104,829	15,770	-	-	-	-
4	407,558	373,109	34,449	-	-	-	-
5	3,854,215	3,403,760	450,455	-	-	-	-

Note: Years 1 & 2 cover surface construction and drift access to the seam.

8.3 Where the Activities are Proposed to be carried out

The nature, extent and location of the Project's activities, provided below in Table 4, have been selected to:

- maximise coal recovery;
- optimise operations;
- commence mining where lower costs and higher economic returns are possible;
- avoid and minimise environmental impacts; and
- avoid resource sterilisation.

As discussed above, construction and establishment of surface infrastructure will occur in parallel with drift and shaft construction in Year 1 and Year 2 with in-seam development of the mine planned to commence in Year 3. Longwall production is currently scheduled to commence Year 5.

Table 4. Nature and Extent of Activities for the IDP term

Nature and Extent of Activities		Location
Year 1	Construction as per sequence above in Section 8	Figure 4 and Figure 5
Year 2	Construction as per sequence above in Section 8	Figure 4 and Figure 5
Year 3	Mining and production as per sequence above in Section 8 and Table 3	Figure 4 and Figure 5
Year 4	Mining and production as per sequence above in Section 8 and Table 3	Figure 4 and Figure 5
Year 5	Mining and production as per sequence above in Section 8 and Table 3	Figure 4 and Figure 5

9. THE LOCATION AND ESTIMATE OF THE RESOURCE

The Project lies on the western limb of the Bowen Basin, adjacent to the boundary between the Collinsville Shelf and the Nebo Synclinorium. The Collinsville Shelf is characterised by a thin accumulation of sediments, gentle easterly dips and minor structural deformation. The boundary is marked by a major thrust fault – the north-northwest trending Isaac Fault – which marks the eastern boundary of the Project area. The stratigraphy of the Project area is provided below in Figure 7, Figure 8 and Figure 9 and comprises the following:

- Triassic Rewan Group; and
- Late Permian, Blackwater Group, which can be subdivided into:
    - Rangal Coal Measures;
    - Fort Cooper Coal Measures; and
    - Moranbah Coal Measures.

In the Bowen Basin, coals of the Blackwater Group have only been mined commercially to date from the Rangal Coal Measures and the Moranbah Coal Measures. In the Lake Vermont Project MLA area, only the Rangal Coal Measures of the Late Permian Blackwater Group are considered suitable for mining. Seams of the Moranbah Coal Measures and Fort Cooper Coal Measures, while present in the MLA area, are not planned to be mined for the following reasons:

- in the Lake Vermont Extension Project area, the Moranbah Coal Measures occur at depths between 400-900m and are thus considered non-mineable in the Project area; and
- the Fort Cooper Coal Measures, characterised by tuffaceous sandstones and siltstones interbedded with high-ash coal, carbonaceous mudstone, tuffaceous mudstone, and siltstone, provide extremely low yields at high ash and have no current economic potential.

The project's target Rangal Coal Measures are comprised of light grey, fine to medium grained lithic sandstones, grey to dark grey siltstones and mudstones, carbonaceous mudstones, carbonaceous claystones and up to two thick coal horizons: the Leichhardt or Leichhardt Lower seam and the Vermont Lower seam.

The primary underground target seam is the Vermont Lower Seam which extends across the entire underground mining footprint. The overlying Leichhardt Lower Seam, which is a secondary underground target seam, is only present across the northern half of the underground footprint.

The Vermont Lower Seam occurs at depths ranging from approximately 150m in the south-west of the underground mining footprint to approximately 500m in the north-east. The Leichhardt Lower Seam occurs at depths ranging from 250m in the west of the underground mining footprint and approaching 500m in the far north-east of the mining area. No proposed partial recovery of any other target resources is currently contemplated for this project.

Age	Group	Formation	
		Southern Bowen Basin	**Northern Bowen Basin**
Quaternary		Alluvium	Alluvium
Tertiary		Alluvium	Alluvium
		Main Range Basalt	Main Range Basalt
		Duaringa Formation	Duaringa Formation
Triassic	Rewan Group	Arcadia Formation	Arcadia Formation
		Sagittarius Sandstone	Sagittarius Sandstone
Late Permian	Blackwater Group	Rangal Coal Measures	Rangal Coal Measures
		Burngrove Formation	Fort Cooper Coal Measures
		Fairhill Fomration	
		Macmillan Formations	Moranbah Coal Measures
		German Creek Formation	
Middle Permian	Back Creek Group	Ingelara Formation	Blenheim Formation

Figure 7. Bowen Basin Regional stratigraphy

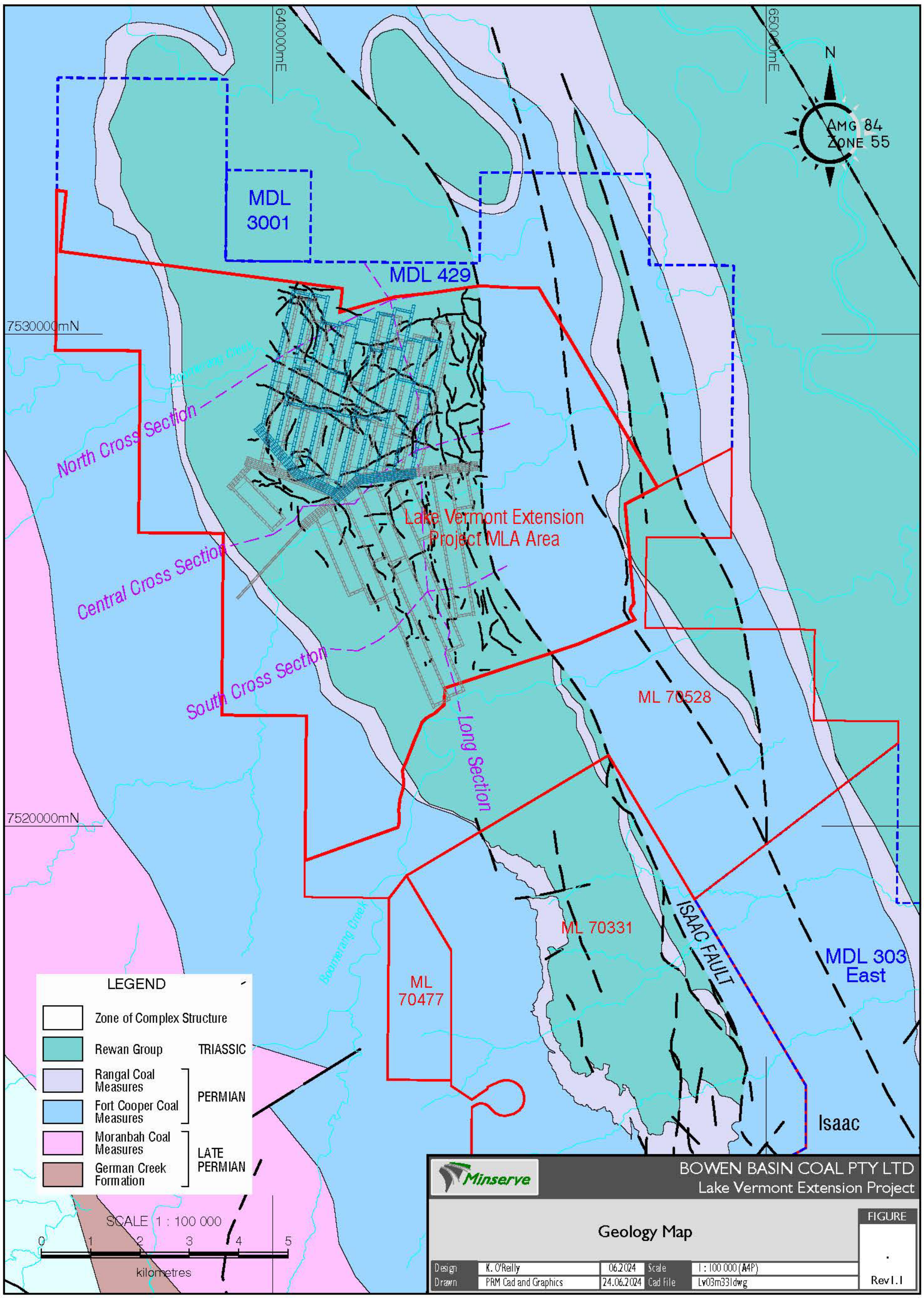

Figure 8. Geology Map

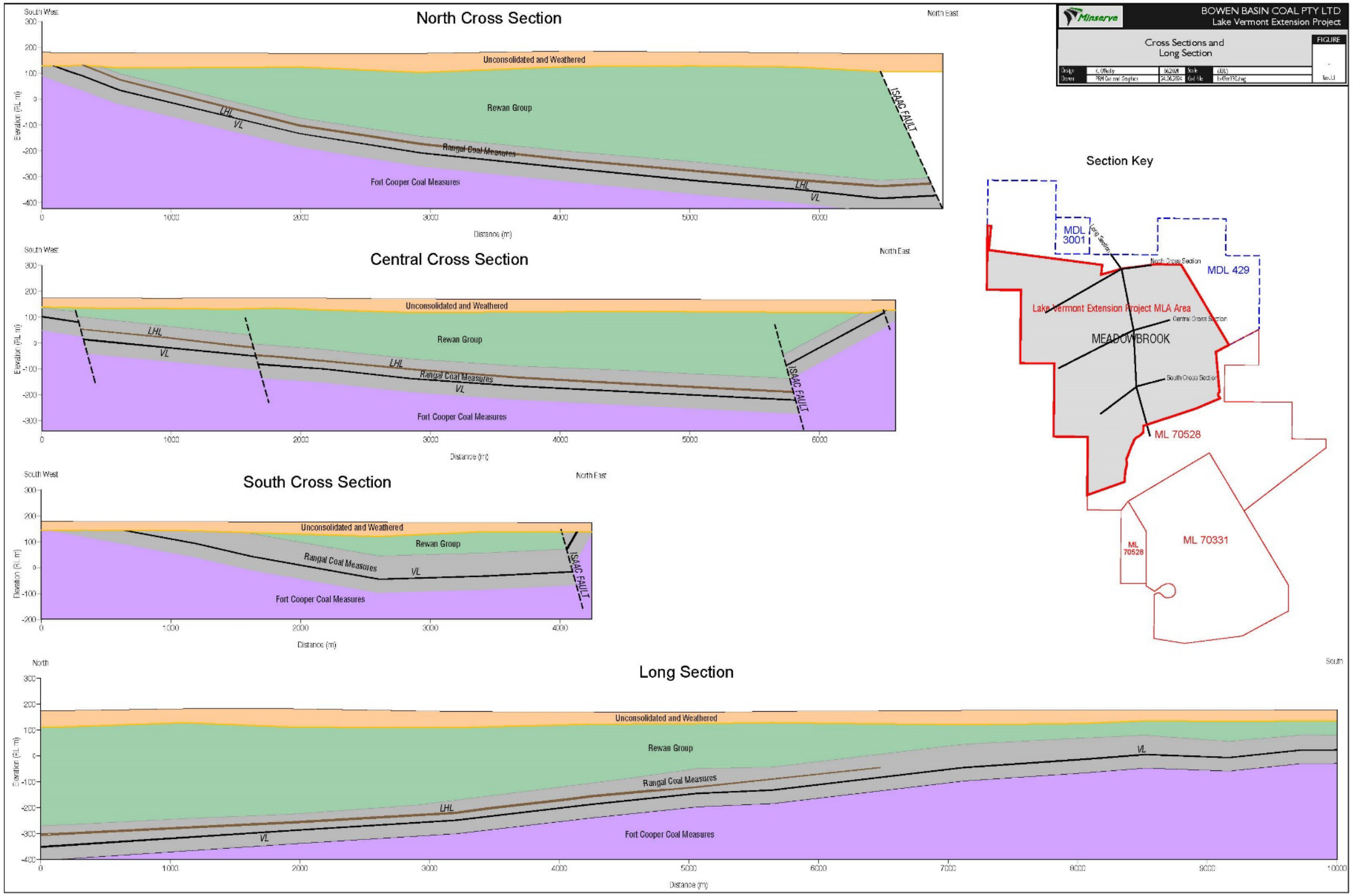

Figure 9. Cross sections and long section

9.1 Local Geology – target Rangal Coal Measures

Stratigraphic units present in the Project area are presented in Figure 10. Commercially recoverable coal resources in the Project occur in the Rangal Coal Measures between the crop of the Vermont Lower seam in the west and the Isaac Fault to the east from depths of 30m to 50m near the crop of the prospective seams to more than 550m depth to the Vermont Lower seam in the north-eastern corner of the deposit, adjacent to the Isaac Fault.

Leichhardt Lower Seam (LHL)

As the Leichhardt seam thins and deteriorates northwards within MDL 303, the LHL develops below it. Initially the LHL occurs as a coaly/carbonaceous horizon with no economic potential, which gradually thickens and improves towards the north. In the south, the LHL attains a mineable quality at approximately 2m thickness along a line termed the LHL Effective Limit. To the south and west of this line, the seam is considered to have no economic potential.

The LHL thins to the west, and over most of the potential open cut area it is between 2m to 3.5m thick. The seam splits in the north-western corner of MDL 429 into a thin (0.3m to 0.6m) generally high ash upper seam (LHL1) and a thicker (2.2m to 3.4m) lower seam (LHL2) which is separated by 0.1m to 0.8m of coaly mudstone.

Vermont Lower Seam (VL)

The VL is the principal commercial seam throughout the Project area and has been intersected at depths ranging from 27m (weathered) to 557m (Figure 11). The faults shown on the plan within the 3D seismic area are sourced from the interpretation of the 3D seismic (Figure 12); however, these are limited to faults with throws consistently greater than seam thickness. Within MDL 303, the VL maintains a consistent thickness of 3.5m to 4.5m until it splits in the north-western corner of the MDL into two, thin, higher ash seams, the Vermont Lower 1 seam (VL1) and the Vermont Lower 2 seam (VL2).

Girrah Seam

The uppermost seam in the Fort Cooper Coal Measures in the Project area is the Girrah Seam which was intersected at depths below the Vermont Lower seam in several holes in the north-west of MDL 429.

Bowen Basin Coal has a planned feasibility study in FY2025/2026 for MDLs 303 and 429 to assess the prospectivity of pre-gas drainage from the Girrah seam as part of the company's Lake Vermont Extension Project pre-drainage strategy. Pre-drainage of the Girrah seam is considered unlikely to occur in the first five years of the Lake Vermont Extension ML as the concept is currently in pre-feasibility stage. Should the study prove successful, pre-drainage of the Girrah seam may be considered as part of a Later Development Plan for the ML.

9.2 Local Structure

The Isaac Fault passes approximately north to south through the Project area and separates relatively undisturbed sediments of the Western block from a complex zone of folded and faulted sediments to the east. The structure in the Project area is dominated by the Isaac Fault; however, several other persistent faults have been identified in the Project area. As the intensity of faulting decreases away from the Isaac Fault, significant areas of ground between the major faults are considered available for underground mining.

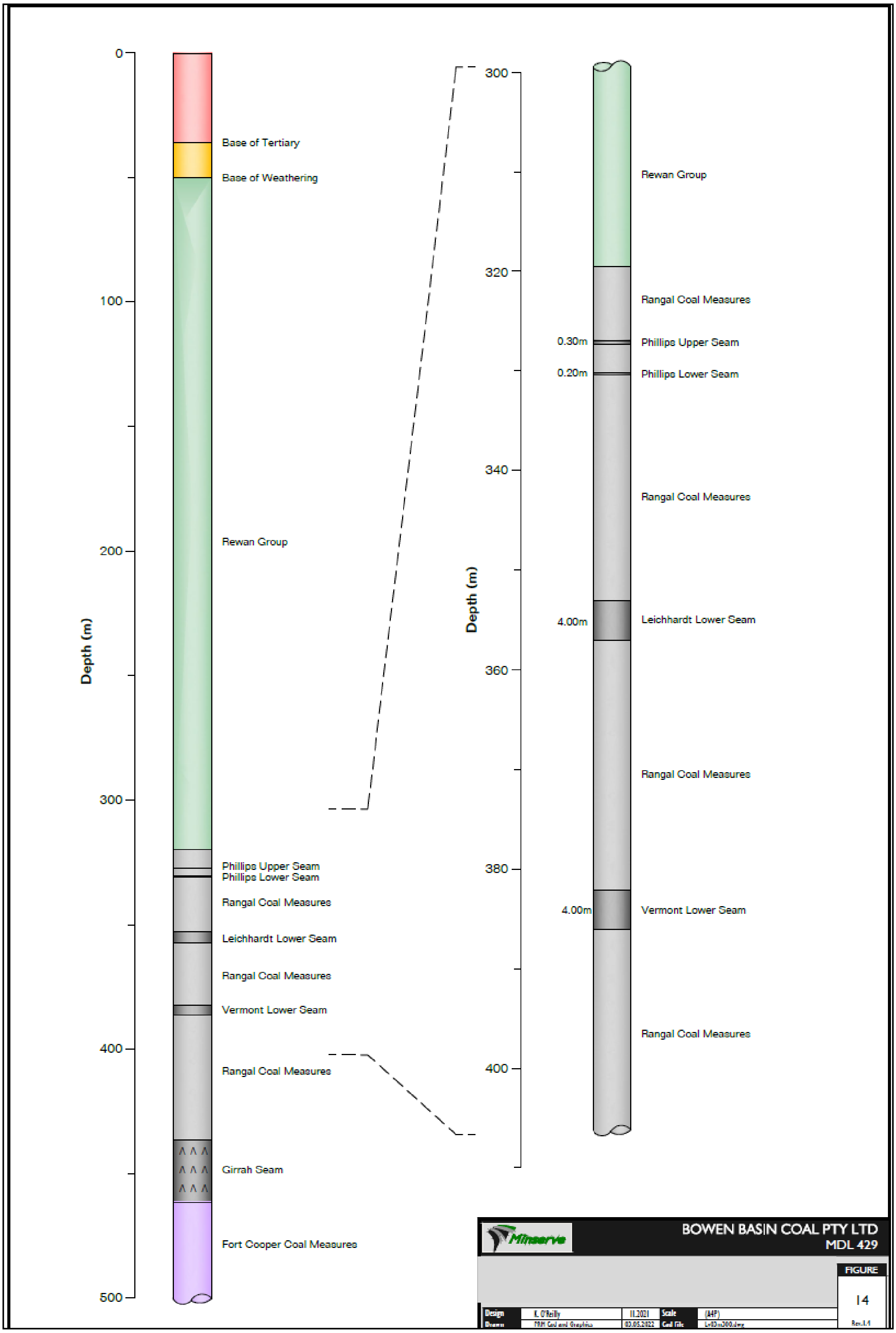

Figure 10. Typical Lake Vermont Extension Project stratigraphy – MDL 429

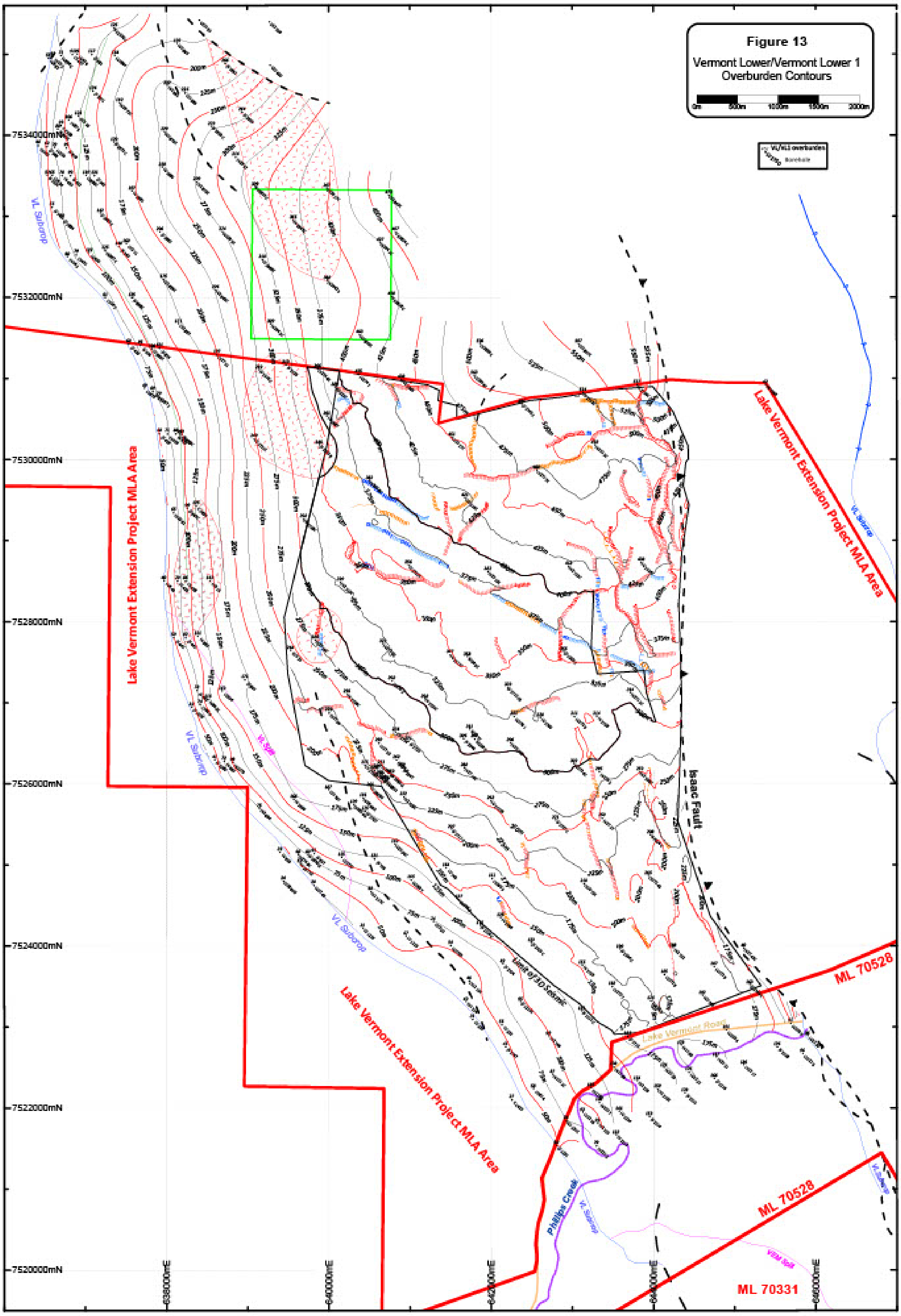

Figure 11. Vermont Lower Overburden Contours

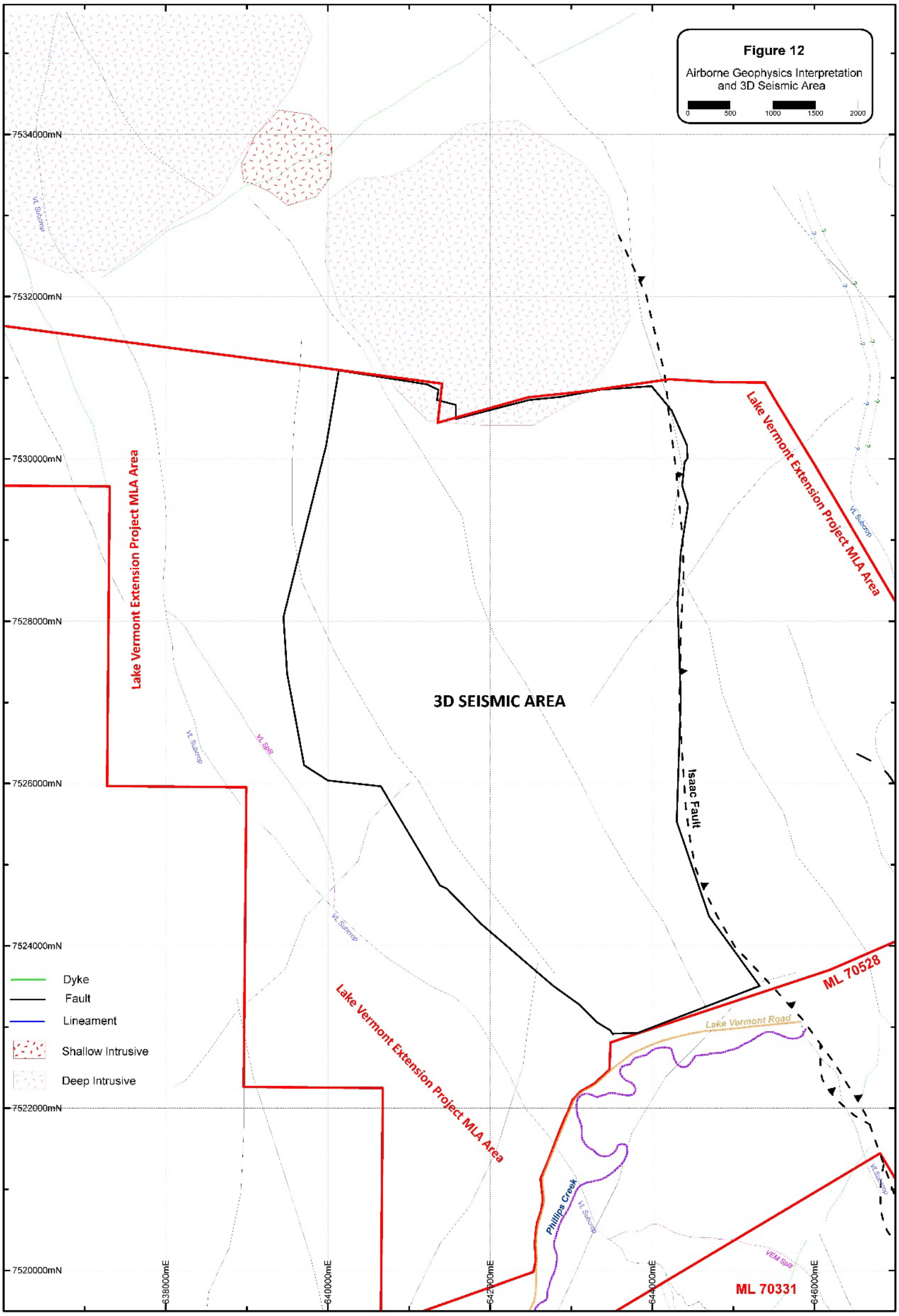

Figure 12. 3D Seismic Area

10. RESOURCE AREA AND RECOVERABLE RESOURCES

The estimates of the Coal Resources of the Leichhardt Lower and Vermont Lower seams of the Rangal Coal Measures reported in this Initial Development Plan are considered to be a true reflection of the coal resources as at March 2022. The estimates have been carried out in accordance with the principles and guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves published in December 2012 (The JORC Code) as issued by KORE Consulting and provided below in Table 5 and Appendix 2.

As indicated below in Table 5, the Project area contains Measured and Inferred resources only. The MLA area was assessed in March 2022 as containing 326Mt total; comprising 258Mt Measured and 68Mt Indicated. The Project's previous areas of Indicated resources (assessed in 2017) were located in the south-western and north-eastern corners. These Indicated resource areas were reassessed and upgraded to Inferred and Measured as a result of a large 3D seismic survey and drilling program which were completed post-2017 (Appendix 2).

The assessed estimate of the Coal Resources as provided in Table 5 has been assessed within the limit of the Lake Vermont Extension Project MLA boundary, and do not include any coal resources outside of the limits of the MLA area.

Table 5. Estimated coal resources for Lake Vermont Extension Project

Seam	Tenement	Block	Status	Area	Think	Volume	RD	Tonnes
				m^2	m (ave)	m^2 x 10^6	In situ	X 10^6
Leichhardt Lower	**MDL 303**	**Sub-total**	**Indicated**	**1.86**	**1.98**	**3.68**	**1.53**	**5.6**
Leichhardt Lower	MDL 429	Western	M + Ind	20.43	3.54	72.27	1.45	104.6
Leichhardt Lower	MDL 429	Central	Indicated	0.56	1.86	1.04	1.50	1.56
Leichhardt Lower		**Sub-total**	**M + Ind**					**106.2**
Vermont Lower	MDL 303	Western	Measured	9.38	3.95	37.08	1.39	51.6
Vermont Lower	MDL 429	Western	M + Ind	27.58	3.77	104.06	1.41	146.9
Vermont Lower	MDL 430	Central	Indicated	0.96	4.64	4.43	1.38	6.1
Vermont Lower		**Sub-total**	**M + Ind**					**204.7**
Vermont Lower 1	MDL 303	Western	Indicated	0.97	1.56	1.51	1.49	2.3
Vermont Lower 1	MDL 429	Western	Indicated	1.07	1.32	1.16	1.46	1.7
Vermont Lower 1		**Sub-total**	**Indicated**					**3.9**
Vermont Lower 2	MDL 303	Western	Indicated	0.97	2.51	2.43	1.45	3.5
Vermont Lower 2	MDL 429	Western	Indicated	1.07	1.51	1.48	1.46	2.2
Vermont Lower 2		**Sub-total**	**Indicated**					**5.7**
All seams		**Total**	**M + Ind**					**326**

Planned infrastructure placement within the Project area will be designed to both optimise the recovery of the State's coal resources and minimise the potential for resource sterilisation to any overlapping gas party as part of the applicant's endeavors to maximise overlapping tenure coexistence.

10.1 Standard and Procedures used to make the Resource Estimate

Coal Resources have been estimated in accordance with the "Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ~ The JORC Code ~ 2012 Edition" (the Code) and the associated "Australian Guidelines for the estimation and classification of Coal Resources 2014 Edition" (the Guidelines).

The Code defines a mineral resource as a “concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade (or quality), and quantity that there are reasonable prospects for eventual economic extraction. All reports of Mineral Resources must satisfy the requirement that there are reasonable prospects for eventual economic extraction (i.e. more likely than not), regardless of the classification of the resource.

11. EXPLORATION

Exploration in the Lake Vermont Extension Project area has comprised both drilling and seismic programs as follows:

- 2006: Multiple holes were drilled prior to 2008 in the Project area to help define resources west of the Isaac Fault. Several of the holes were drilled to the north of MDL 429 and, where relevant, have been used to control structural trends along the northern boundary of the deposit;
- 2010: Drilling carried out in MDL 303 was completed in the north-western section of the MDL to help define potential open cut resources in the Western block;
- 2012-2013: A program of drilling was carried out with the aim of raising resources in the Western block of MDL 303 south of Phillips Creek (now ML 70528) to Measured status;
- 2015-2016: A total of 24 geophysically logged holes were drilled at 17 sites throughout most of MD L303 and MDL 429 to help improve the resource assessment to Indicated status. Coal quality data were obtained from each of the 17 sites; and
- 2020-2021: A total of 169 holes were drilled over the two-year program, comprising:
  - 134 holes for structure/stratigraphy, coal quality and rock strength;
  - 20 holes (including two re-drills) which were drilled primarily for the assessment of seam gas quantity and composition in addition to permeability and horizontal stress studies; and
  - 15 holes specifically drilled for collection of samples for geotechnical assessment.

At the completion of the 2021 exploration program, a total of 402 holes in, and adjacent to, the Project area were available for use in modelling the Project and estimating resources (Figure 13).

11.1 Seismic Programs

The acquired seismic surveys are provided below in Figure 13 and described as follows:

- mini-SOSIE seismic line (2005-1) was recorded across the north-western section of MDL 303 and the southern part of MDL 429 in 2005 to trial the applicability of the method in an area of deep weathering. Following this trial, six new lines were recorded across MDL 429, MDL 303 and ML 70331 in 2006. Three lines – 2005-1, 2006-5 and 2006-6 – cross the Project area and provide solid information on coal seam continuity and structure. Three additional Mini-SOSIE lines to help define structure and confirm coal seam continuity were recorded and processed in 2016;
- In 2020, Velseis recorded, processed and interpreted a 3D seismic program over the proposed Lake Vermont area in two stages: Velseis acquired stage 1 during May 2020 and acquired stage 2, located north of stage 1, during October and November 2020; and
- following the two-stage 3D acquisition, the volumes were processed and merged during November and December 2020. The final merged volume totalled approximately 22km^2. Data quality was assessed as excellent, with the 3D dataset allowing for structures to be accurately defined and characterised across the study area.

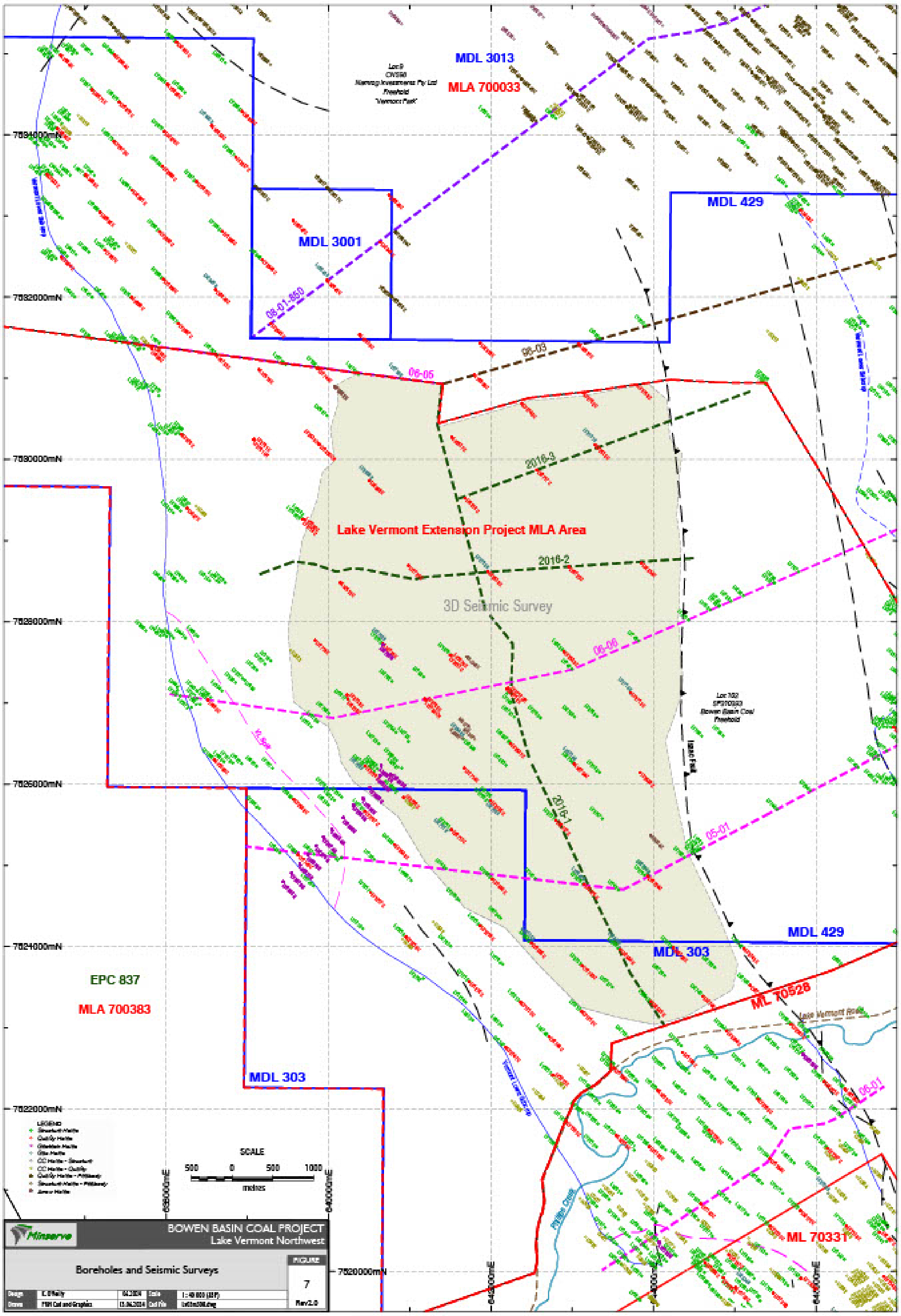

Figure 13. Boreholes and Seismic Surveys

12. RATE AND AMOUNT OF PROPOSED MINING

The Project includes underground single and dual-seam longwall mining, open cut mining activities and development of supporting infrastructure. The Project will enable the future Lake Vermont Complex (existing Lake Vermont Mine and the proposed Project) to maintain production at approximately 9Mtpa (of product coal) for an estimated 20 years.

Approximately 108.6Mt of underground ROM coal, plus 13.3Mt of open cut ROM coal is estimated to be mined over the life of the Project, producing approximately 122Mt of total ROM coal. Project peak production is estimated to occur in Year 6 of 6.9Mt ROM and 6.2Mt of product.

12.1 Proposed mining start date

The proposed mining start date is during Year 3 to allow for a 24-month construction period prior to the commencement of production.

12.2 Schedule for proposed mining during the initial five-year period

The timing of proposed mining is provided in Sections 2.1 and 6.

13. APPROPRIATENESS OF THE PLAN

This Plan is considered appropriate based on the following rationale which considers that the:

- MLA is sufficiently mineralised with coal;
- mineralisation is economically recoverable;
- plan allows for the Lake Vermont Extension Project to be developed so that the coal will be extracted in the most efficient and economically viable way;
- proposed production commencement date is considered appropriate due to the period of construction required to bring the mine into operation;
- Project includes working with the overlapping tenure holders to optimise development of the State's coal and gas resources;
- Plan includes measures to avoid and reduce the potential impacts of the Project on the environment; and
- Plan complies with the relevant requirements for IDPs.

14. PROJECT NEED

The Project will produce a primary Low Vol HCC, a secondary Mid Vol PCI coal and a tertiary Industrial/Thermal coal (CV 5500 NAR) in a 69:22:9 ratio compared to the current Lake Vermont Open Cut operation which produces the same products in a 65:26:9 ratio. All coal types are in demand globally. The key drivers for the ongoing development of coal projects in Queensland are:

- sustained global demand for coking coals for production of steel. Current market expectations are for Australian exports of coking coal to continue steady growth over coming years as economic resources in other jurisdictions are depleted and demand in the Asia Pacific region grows, particularly in India;
- low ash coking coals, such as that proposed to be produced by the Project, have deep market acceptance, penetration and need as a blending coal in steel production;
- the Project provides regional employment opportunities and economic activity to support local communities;
- the Project will make use of strategic resource infrastructure capacity including power, water, communications, rail and port services;
- the Project will provide jobs for the coal sector's workforce, as well as providing training opportunities for apprentices and Indigenous Australians; and
- the Project will contribute to the state's economic growth.

The environmental impact assessment process and EA amendment application process have been applied to the Project's formulation to date through the Department of Environment, Science and Innovation. Through this process, the environmental, social, health and safety, economic constraints and opportunities of the Project have been examined and measured to manage beneficial and adverse impacts respectively.

An assessment of the consequences of not proceeding with the Project has been conducted. Were the Project not to proceed, the following consequences are inferred:

- the output from the existing Lake Vermont Mine will markedly decline beyond 2028 and result in a direct loss of approximately 410 workers over a period of 20 years. This outcome will result in flow-on impacts (both direct and indirect) to the local Dysart community and the surrounding regional economy;
- alterations to current land use practices would not occur;
- approximately 122Mt of ROM coal would not be mined, resulting in a loss of mining royalties; and
- there would be a loss of State and Federal tax revenue.

15. ECONOMIC BENEFITS

An economic impact assessment of the Project was completed as part of the Project's EIS. This assessment established that the Project would generate significant economic, employment and income benefits at regional, State and national frames of reference. In summary, the key benefits of the Project include:

- an increase in State export revenues;
- an increase in direct royalty and payroll tax payments to the Queensland Government. The Project is estimated to provide additional tax revenues of approximately $1,919.4 million annually to the Australian Government. On an average annual basis, the Project is estimated to provide additional tax revenues of approximately $1,334.5 million per annum to the Queensland Government;
- direct and indirect increases in employment and industry activity in the region, Queensland and Australia over the life of the mine;
- at Project full development, the operational workforce for the Lake Vermont Mine Complex (i.e. operation of the existing Lake Vermont Mine, together with the Project) is estimated to be 860 workers (450 workers associated with open cut operations and 410 workers associated with underground operations);
- benefits to business, employment and supply chain development in the regional economy as a result of the goods and services required;
- direct skills development and training opportunities in the region via Project apprenticeships, traineeships and capacity building; and
- increased company tax and income tax payments to the Australian Government.

16. PUBLIC INTEREST

This document satisfies a public interest in accordance with s318AK of the MR Act by having a positive impact overall in terms of government policy, value of commodity production, employment creation, total return to the State and Australia and social benefits.

The Project provides for a continuation of the existing Lake Vermont Mine. This continuation provides critical context on which to understand and assess the potential social impacts and benefits of the Project. Given that the Project does not seek to expand production output and does not result in a long-term increase in local and regional employment above current levels, the Project will result in minimal social impacts over and above the current status quo.

The primary benefits in public interest provided by the project therefore are to maintain current employment levels and the flow-on benefits to local and regional businesses for an additional 20 years beyond what will occur should the Project not proceed. These stated benefits will maintain the health and wellbeing of Dysart and surrounding local communities and will also help maintain future State incomes in the form of royalties and taxes.

A detailed social impact assessment has been conducted as part of the overall Environmental Impact Study process. Consultation with local community stakeholders, the Isaac Regional Council and the State Coordinator General's Office has been undertaken to communicate the need for the Project, seek feedback and gauge community interest. Greater than 90% of the interest groups consulted provided strong positive feedback for the Project and the positive benefits that the Lake Vermont Mine provides to the community. Should the Project proceed, additional funding commitments to the Dysart community have been outlined in the EIS in response to the consultation feedback. These commitments include funding to a local childcare facility, support to the local primary and high schools, funding to NAIDOC, funding toward a local bus provider for disadvantaged residents and an annual contribution to the Isaac Affordable Housing Trust for the life of the project.

17. THE EFFECT ON, AND THE INTERESTS OF, PETROLEUM HOLDERS

All petroleum holders located either within or adjacent to the Lake Vermont Extension MLA are CSG tenure holders. Authority to Prospect (ATP) 1103 overlaps the entire MLA area. ATP 1103 is held by CH4 Pty Ltd. ATP 1031 overlaps the eastern corner of the MLA (Figure 14). ATP 1031 is held by (Bow CSG Pty Ltd). CH4 and Bow CSG are wholly-owned subsidiaries of Arrow Energy Pty Ltd (Arrow). The overlapping tenure with Arrow is currently retained as Potential Commercial Areas because commercial routes to markets have not yet been established.

ATP 814 (Eureka Petroleum Pty Ltd) is also located adjacent to the Project, however, the ATP does not overlap the Project. Eureka Petroleum is a wholly-owned subsidiary of Blue Energy Ltd. No geothermal tenure or greenhouse gas tenements overlay, or are adjacent to, the Project site as indicated below in Table 6). As indicated below in Table 6, all petroleum holders located within or adjacent to the MLA are exploring for CSG in their acreage area.

Table 6. Overlapping tenure summary

Petroleum Tenure Holder (CSG)	Tenure Number	Overlying Lots
CH4 Pty Ltd	ATP 1103	Overlying Lot 102/SP310393
Bow CSG Pty Ltd	ATP 1031	Overlying Lot 102/SP310393
Eureka Petroleum Pty Ltd	ATP 814	Adjacent to Lot 102/SP310393

Figure 14 below shows the location of the above listed overlapping CSG tenures. The information required for the CSG Assessment criteria is provided in Appendix 1, which accompanies the MLA. In summary, the Applicant already has an existing relationship and a Co-Development agreement with Arrow. The working model and arrangement between both parties will form the building blocks for the potential use of incidental coal seam gas.

Regular discussions have been held with Arrow as part of the MLA submission process. Both parties have executed Confidentiality Agreements and data sharing is ongoing to facilitate clear knowledge of both parties' intentions and understanding of their resources.

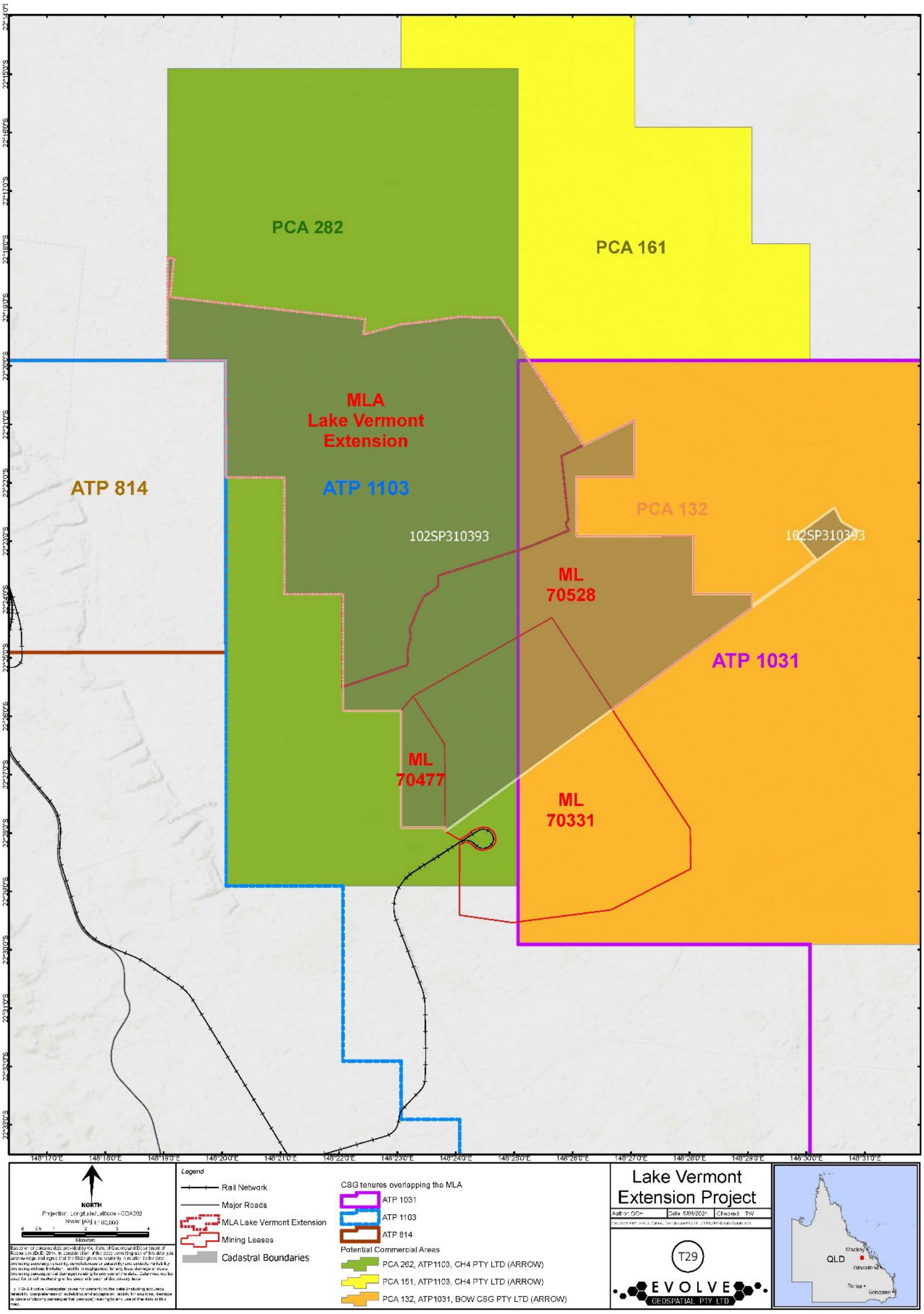

Figure 14. CSG tenures overlapping the Lake Vermont Extension MLA

18. REQUIREMENT TO OPTIMISE USE OF INCIDENTAL CSG

The Applicant considers the extraction and possible use of incidental coal seam gas (ICSG) to be an important component in the development of the Project.

ICSG is present in the Rangal Coal Seam Measures and gas drainage will be required to reduce the in-seam gas contents to below outburst thresholds to ensure safe mining conditions. A Gas Drainage Management Plan is being developed prior to construction which will include the operating and management details of the:

- pre-drainage of the coal seams prior to underground mining;
- post drainage of goaf areas following longwall extraction; and
- dilution of methane via the mine ventilation system throughout mine operations.

An initial assessment of the gas reservoir characteristics has been completed to understand the extent of the gas drainage and mine ventilation options. A multi-well gas pilot is being constructed that will include production testing to support further definition of reservoir characteristics.

Gas pre-drainage will include the use of both SIS as well as UIS drainage drilling. Gas drainage is intended to reduce the in-seam gas content to below outburst thresholds and to a level where the mine ventilation system can adequately dilute the residual gas levels. Once coal mining operations commence, UIS pre-drainage will form the primary pre-drainage strategy.

Gas from UIS and SIS will be pipeline specification gas and will be collected into gathering pipelines and directed to a delivery location where Arrow will have been offered the opportunity to accept this gas and put it to commercial use. If Arrow does not accept the gas, the proponent will continue to seek interest from Independent Power Producers (IPP) for the use of this gas.

As a standard requirement in underground coal mines, ventilation systems will be installed at the commencement of the mine and will progress with the mine as it develops. Due to residual coal seam gas following pre-drainage, the ventilation system will generate ventilation air methane (VAM) which will be vented to the atmosphere. In recent conversations, Arrow has expressed no interest in the VAM and commercial opportunities for use of the VAM in Queensland do not exist. Commercial and regulatory markets for VAM will continue to be reviewed.

Goaf gas will drain via vertical wells to the surface gas infrastructure. The goaf gas is not considered pipeline specification gas and is therefore only suitable for power generation. Arrow has no history of using goaf gas and it is expected that this gas will be of interest to the IPPs.

19. MANAGEMENT OF INCIDENTAL MINE GAS

The Applicant will pursue gas drainage and management strategies for any ICSG to meet the objectives of the State and optimise the economic benefits that can be achieved.

19.1 Consistency with Petroleum Lease Development Plan and relevant Coordination Agreement

As the Project area does not fall within the area of a Petroleum Lease, section 318DX does not apply to this MLA for the purposes of this IDP. The Applicant already has an existing relationship and a Co-Development agreement with Arrow – the overlapping tenure petroleum tenure holder of ATP 1103.

Discussions have already commenced between the Applicant and Arrow relating to:

- project Area mining schedule;
- project Area mining rates;
- project Initial Mining Area and Future Mining Area;
- proposed degassing plans and forecast annual SIS and UIS gas production; and
- exploration data.

20. ANY OTHER MATTER PRESCRIBED BY A REGULATION

There are no other matters relating to an IDP prescribed by regulation.

21. WHETHER THE MINING OF MINERALS THAT, UNDER S243, ARE SOUGHT TO BE SPECIFIED IN THE LEASE WILL BE OPTIMISED IN THE BEST INTERESTS OF THE STATE, HAVING REGARD TO PUBLIC INTEREST

The target mineral being sought is coal. Section 16 indicates that the Project satisfies a public interest test by having a positive impact overall in terms of government policy, value of commodity production, employment creation, total return to the State and Australia, and social benefits.

The applicant has applied the concepts of Ecologically Sustainable Development, including the precautionary principle, principle of intergenerational equity, conservation of biological diversity and ecological integrity and improved valuation and pricing of environmental resources for all phases of Project.

22. THE CSG ASSESSMENT CRITERIA

The MLA Applicant has considered the CSG assessment criteria as follows:

- the Applicant will continue to engage with Arrow on each other's respective projects; and
- development of the Project is considered unlikely to affect any matter of public interest.as outlined in Section 16 and Appendix 1.

KORE Consulting

Meadowbrook

Statement of Coal Resources
within Bowen Basin Coal's
Meadowbrook Property

December 2022

prepared for

Bowen Basin Coal Pty Ltd

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Project Name	|	Meadowbrook Underground
Project No.	|	JR001
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Print Date	|	December 2022.
Document Name	|	Meadowbrook Resources 2022

Rev No	Date	Revision Details	Author	Approved
Report 01		Draft Report for Review	KO'R	

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Appendix C — JORC Table 1

1 PURPOSE OF RESOURCE STATEMENT

KORE Consulting Pty Ltd has prepared this report on the coal resources of Meadowbrook Property which overlies parts of Mineral Development Licences (MDLs) 303 (Lake Vermont), and 429 (Lake Vermont North) for Bowen Basin Coal Pty Ltd, the company that holds tenure over the area. The resources are estimated as at March 2022 and are a subset of the resource estimates for MDL 303 and MDL 429 from resource statements prepared in June 2020 for Lake Vermont East (O'Reilly, 2020) and July 2022 for Lake Vermont Northwest (O'Reilly, 2022).

The purpose of this report is to provide an assessment of the coal resources in Bowen Basin Coal's Meadowbrook Property, prepared in accordance with the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code), 2012 Edition.

2 COMPETENT PERSONS STATEMENT

This report is based on data compiled by Ken O'Reilly, who is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM) and is the Principal Consultant employed by KORE Consulting Pty Ltd. The data was modelled by Ken O'Reilly using Surfer. The area west of the Isaac Fault and was subsequently modelled in Vulcan by Mr Adrian Buck, John T Boyd Company's (BOYD) principal geologist.

Ken O'Reilly has 41 years' experience in the estimation of resources for coal projects in Australia and overseas, principally in the Bowen Basin of Queensland, but also in the Sydney and Gunnedah Basins of New South Wales and the Kutai Basin in Kalimantan, Indonesia. This expertise has been acquired through exploration and evaluation activities in coal exploration areas and operating coal mines. This experience is more than adequate to qualify him as a Competent Person as defined in the JORC Code.

Mr Buck is a full-time employee of BOYD and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he has undertaken 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".

The estimates of Coal Resources for Meadowbrook presented in this report have been prepared in accordance with The JORC Code (2012).

Ken O'Reilly, B.Sc. (Hons), MAusIMM.

3 INTRODUCTION TO THE DEPOSIT

Meadowbrook is located 15km to 30km north-northeast of Dysart in Central Queensland and 250km by road southwest of the coastal city of Mackay (Figure 1). MDL 303 and MDL 429 were granted to Bowen Basin Coal Pty Ltd (BBC) between September 1997 (MDL 303) and May 2012 (MDL 429).

Meadowbrook was originally part of EPC 549 (Lake Vermont), granted in February 1994 over an area of 360km^2 to explore for commercial, export quality deposits of coking and/or thermal coal in the Late Permian, Rangal Coal Measures on the western limb of the northern Bowen Basin. EPC 549 was located close to existing mining infrastructure and established rail links to Dalrymple Bay and the Port of Gladstone. Parts of the initial EPC were relinquished over the years or incorporated into MDL 303 (originally 155km^2) and MDL 429 (98km^2). MDL 303 was subsequently reduced by the grant of ML 70331 (49km^2) and ML 70477 (4.5km^2). Both MDLs (303 and 429) were reduced by the grant ML 70528 (37.5km^2, Figure 2).

ML 70331 was granted to develop the Lake Vermont Mine, which now produces 10Mtpa of metallurgical and thermal coal for the export market from the Leichhardt seam and the Vermont seam of the Rangal Coal Measures. ML 70477 was subsequently granted to the west of ML 70331 for infrastructure purposes. The grant of ML 70528 allows extension of the existing open cut mining operations to the north and east.

The boundaries of Meadowbrook are defined by (Figure 3):

- West – the western boundaries of MDL 303 and MDL 429;
- South – the boundary between MDL 303 and ML 70528;
- East - the boundary between MDL 429 and ML 70528 in the south and the Meadowbrook/Vermont Park boundary in the north; and
- North - Meadowbrook/Vermont Park boundary.

The area covered by Meadowbrook is flat to gently undulating grazing country with seasonal watercourses of various sizes (Figure 3). The northeast flowing Phillips Creek, the most prominent creek in the Lake Vermont tenements, runs just to the south of Meadowbrook. The northeast flowing One Mile Creek, sub-parallels Phillips Creek 3km to 5km to the north. The east flowing Boomerang Creek (locally known as Hughes Creek) crosses the area north of One Mile Creek and coalesces with One Mile Creek towards the eastern boundary of Meadowbrook. These creeks are tributaries of the Isaac River, which runs generally north-south outside the eastern boundaries of MDL 429 and MDL 303 (Figure 2).

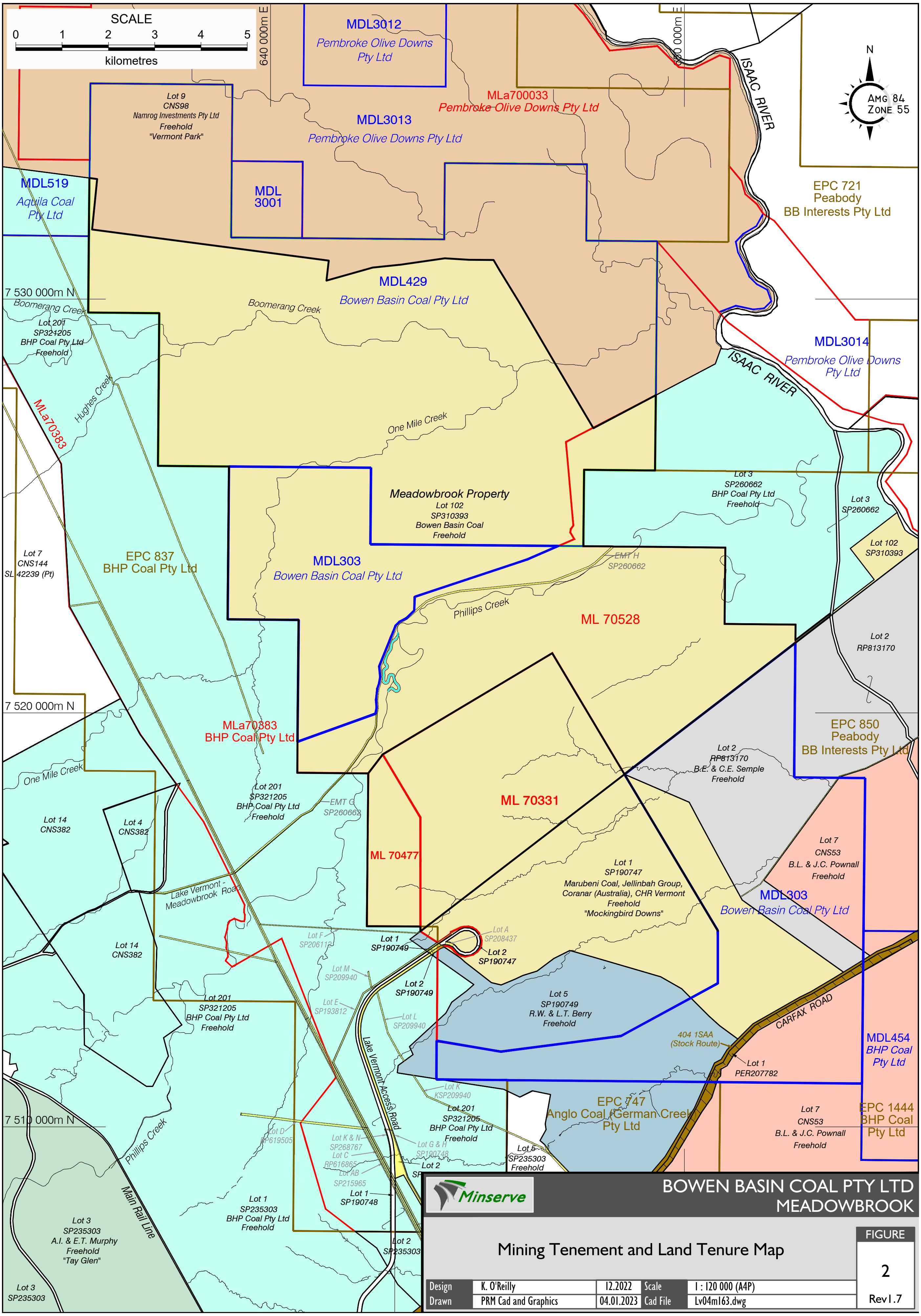
BOWEN BASIN COAL PTY LTD
MEADOWBROOK

Regional Location Map

FIGURE 1

Design	K. W. O'Reilly	12.2022	Scale	NTS
Drawn	The MINSERVE Group	13.12.2022	Cad File	M:\Vc01m\Lv03m043.cdr

Rev 2.0



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Mining Tenement and Land Tenure Map

FIGURE 2
Rev1.7

Design	K. O'Reilly	12.2022	Scale	1 : 120 000 (A4P)
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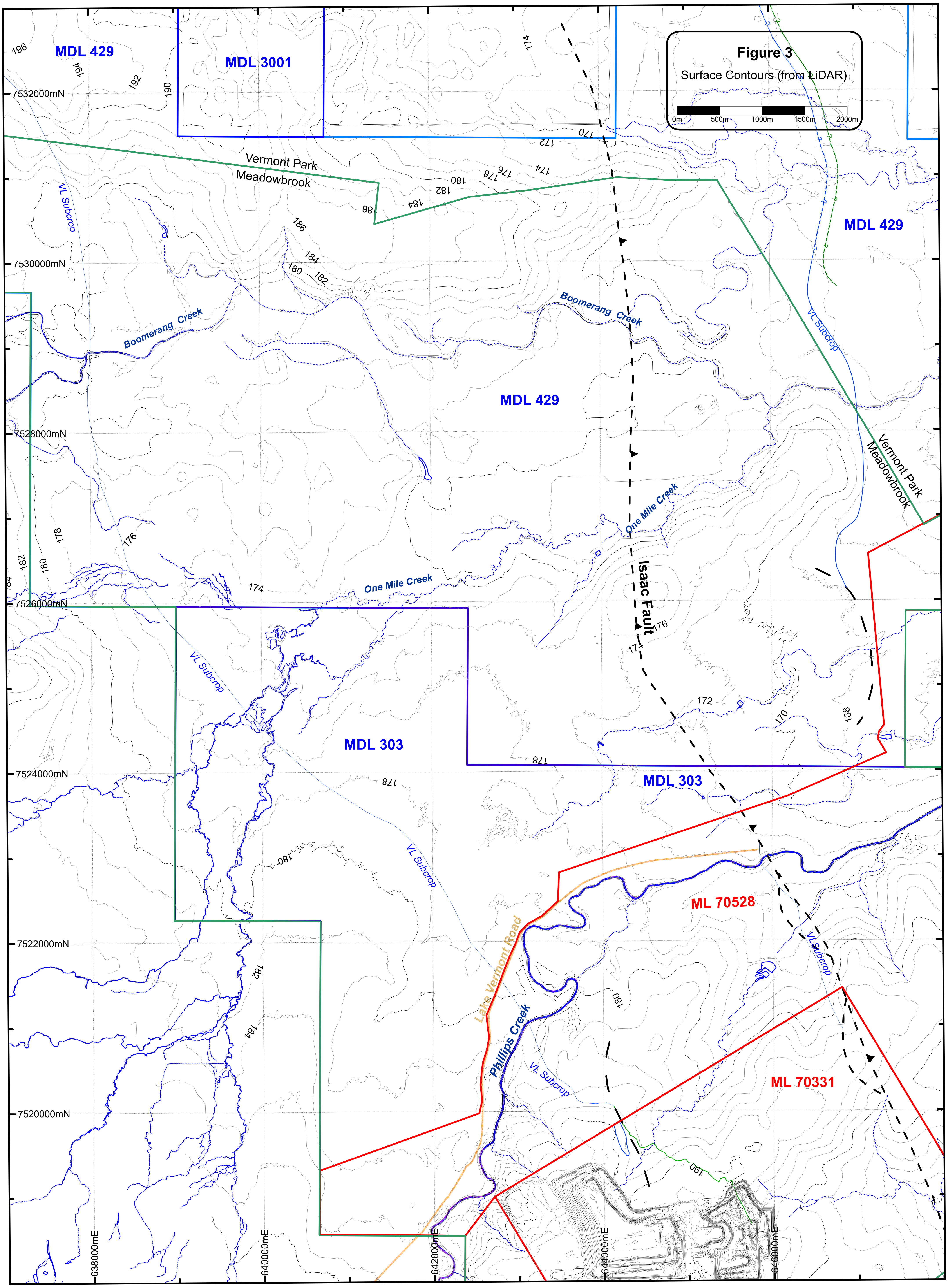


Figure 3
Surface Contours (from LiDAR)
0m
500m
1000m
1500m
2000m
MDL 429
MDL 3001
MDL 429
MDL 429
MDL 303
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Vermont Park
Meadowbrook
Boomerang Creek
Boomerang Creek
One Mile Creek
One Mile Creek
Phillips Creek
Lake Vermont Road
Isaac Fault
VL Subcrop
VL Subcrop
VL Subcrop
VL Subcrop
VL Subcrop
VL Subcrop
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

4 REGIONAL GEOLOGY

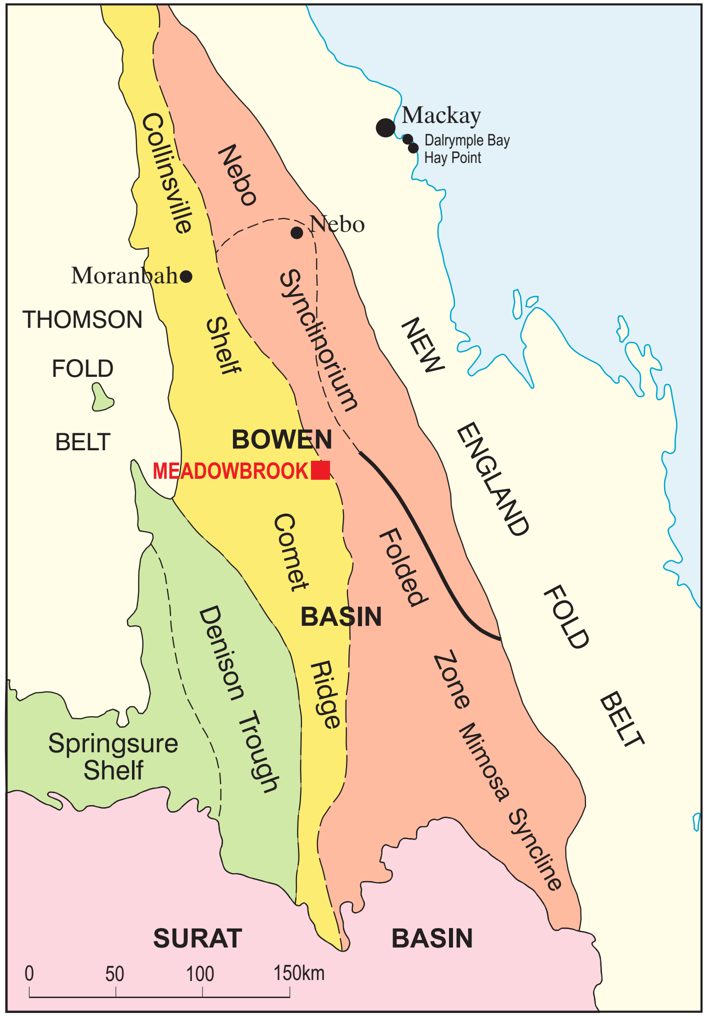
4.1 REGIONAL STRUCTURE

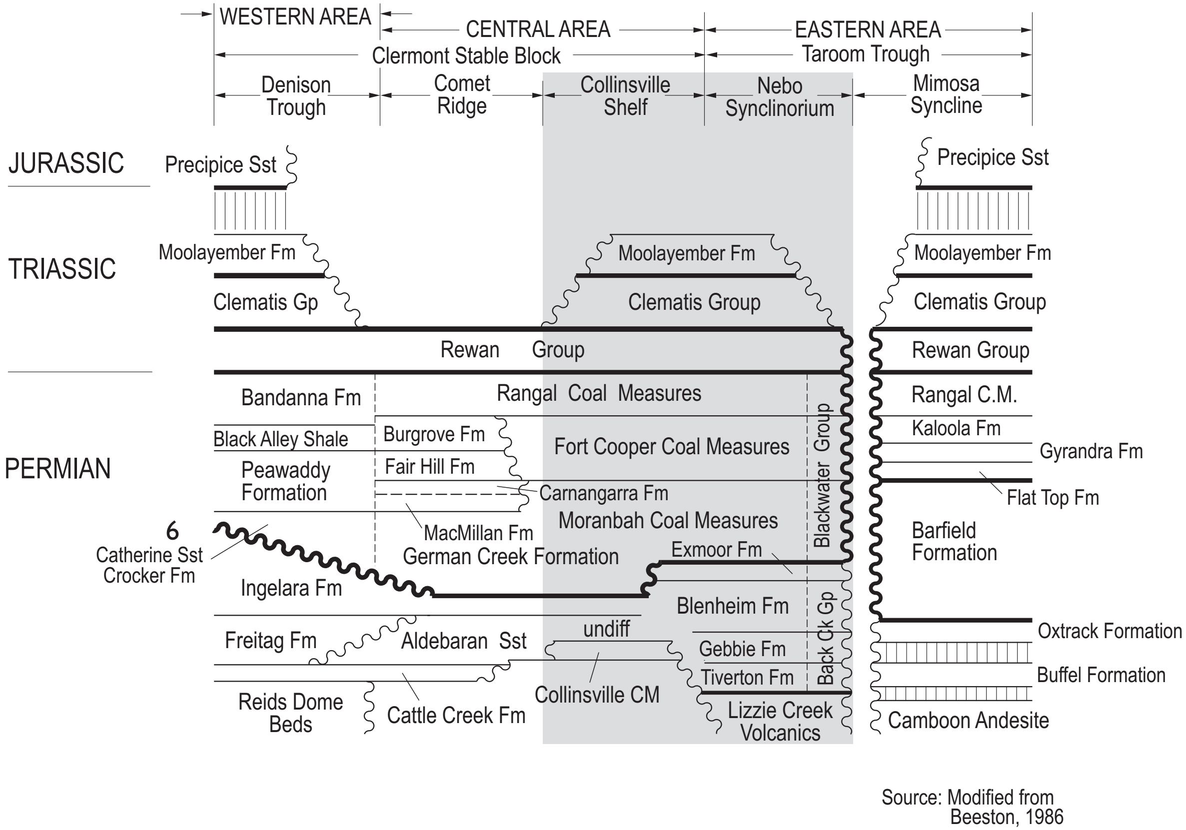
Meadowbrook lies on the western limb of the Bowen Basin, a north to south trending retro-arc basin that extends more than 250km north to south and up to 200km west to east. The basin sequence infilled a rift zone between stable Devonian to Carboniferous rocks of the Thomson Fold Belt to the west, and a Devonian to Permian island arc system, the New England Fold Belt, to the east (Figure 4).

Meadowbrook is located across the boundary between the Collinsville Shelf and the Nebo Synclinorium. The Collinsville Shelf, to the west, is characterised by thin accumulation of sediments, gentle easterly dips and minor structural deformation. The boundary is marked by a major thrust fault, the north-northwest trending, east side up, Isaac Fault (Figure 5), which has a throw of 150m to 400 in Meadowbrook. The fault separates flat lying, relatively undeformed sediments of the Rewan Group and Rangal Coal Measures, to the west (Western Block), from intensively folded and faulted sediments of the Fort Cooper Coal Measures and Rangal Coal Measures (Isaac Block). The Rangal Coal Measures do crop within the Isaac Block, but the crops are discontinuous due to the complex faulting and folding. Where intersected immediately to the east of the Isaac Fault, sediments of the Rangal Coal Measures dip steeply into the fault at 60^{o} to 70^{o} (Figure 6).

The Isaac block is 2km to 3km wide and is flanked to the east in MDL 429 and ML 70528 by another large thrust fault with a throw ranging from 180m in MDL 429, to 150m at the MDL 429/ML 70528 boundary, to 65m in ML 70528. The Rangal Coal Measures crop to the east of this thrust in the Central Block. A third large thrust with throws of 320m to 500m occurs 1km to 2km east of the second thrust in MDL 429 and ML 70528 north, before both faults coalesce just north of the ML 70528/MDL 303 boundary. Seams in the Central Block terminate on this thrust. The Rangal Coal Measures crop again to the east of this thrust in a fourth structural block known informally as the Eastern Block.

The resources reported herein occur between ML 70528 and the northern boundary of Meadowbrook Property, between the crop of the Vermont Lower seam of the Rangal Coal Measures to the west, and the Isaac Fault to the east in the Western Block; and between the crop of the Vermont Lower seam to the west and just outside the eastern boundary of Meadowbrook in the Central Block.





REFERENCE

- SURAT BASIN: Jurassic-Cretaceous - overlies Bowen Basin
- BOWEN BASIN EASTERN AREA: Taroom trough
- BOWEN BASIN CENTRAL AREA: Collinsville Shelf and Comet Shelf
- BOWEN BASIN WESTERN AREA: Springsure Shelf and Denison Trough

- Onlap contact between major tectonic units
- Faulted contact between major tectonic units
- Boundary between structural subdivisions within the Bowen Basin

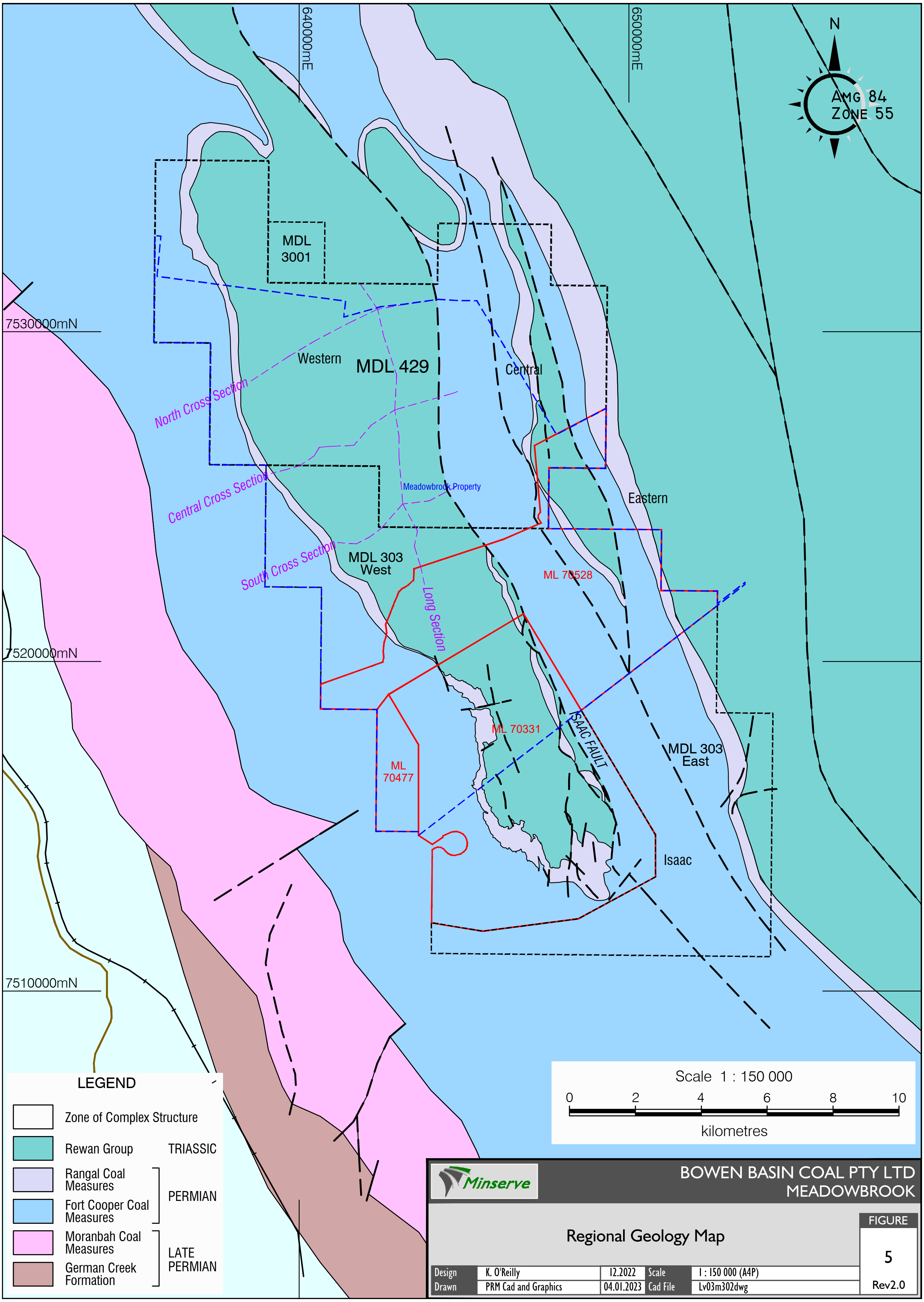
Minserve

BOWEN BASIN COAL PTY LTD
MEADOWBROOK

Bowen Basin Tectonic Units and Regional Stratigraphy

FIGURE 4

Design	K.W.O'Reilly	12.2022	Scale	NTS	
Drawn	The MINSERVE Group	14.12.2022	Cad File	Lv03m248.cdr	Rev 1.0



N
AMG 84
ZONE 55
640000mE
650000mE
7530000mN
7520000mN
7510000mN
MDL 3001
MDL 429
Western
Central
Eastern
North Cross Section
Central Cross Section
South Cross Section
Long Section
Meadowbrook Property
MDL 303
West
ML 70528
ML 70331
ML
70477
ISAAC FAULT
MDL 303
East
Isaac
Scale 1 : 150 000
0
2
4
6
8
10
kilometres
LEGEND
Zone of Complex Structure
Rewan Group
TRIASSIC
Rangal Coal Measures
Fort Cooper Coal Measures
PERMIAN
Moranbah Coal Measures
German Creek Formation
LATE PERMIAN
Minserve
BOWEN BASIN COAL PTY LTD
MEADOWBROOK
Regional Geology Map
FIGURE
5
Rev2.0
Design
K. O'Reilly
12.2022
Scale
1 : 150 000 (A4P)
Drawn
PRM Cad and Graphics
04.01.2023
Cad File
Lv03m302dwg

BOWEN BASIN COAL PTY LTD
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Cross Sections and Long Section

FIGURE 6

Design	K. O'Reilly	12.2022	Scale	(A3L)	Rev.1.6
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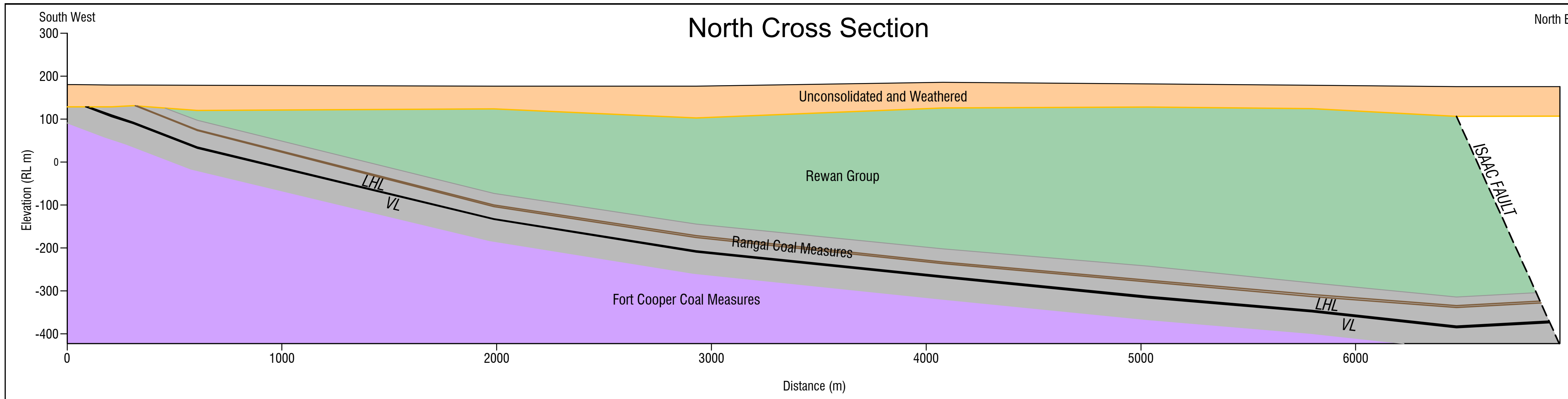
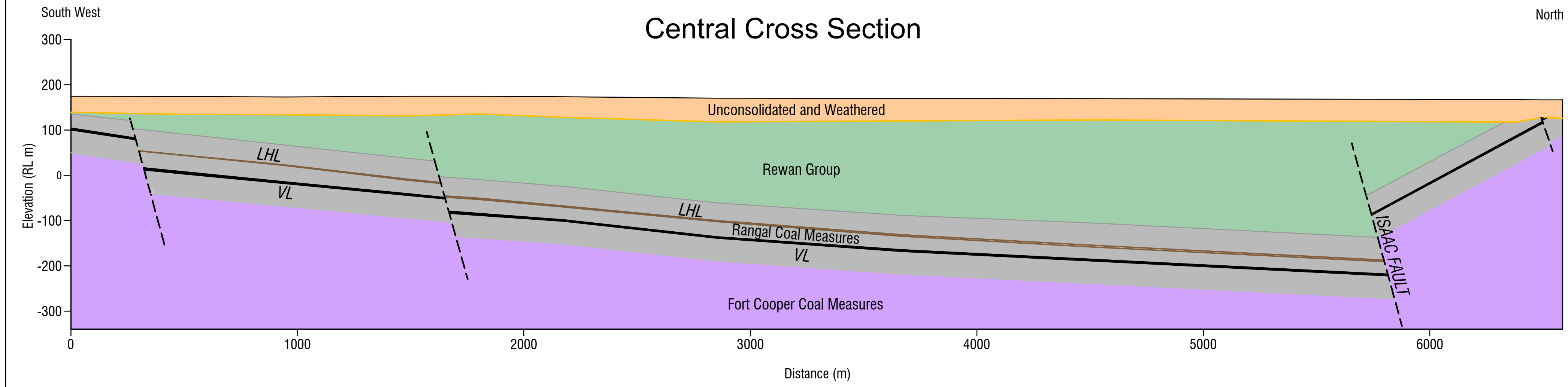
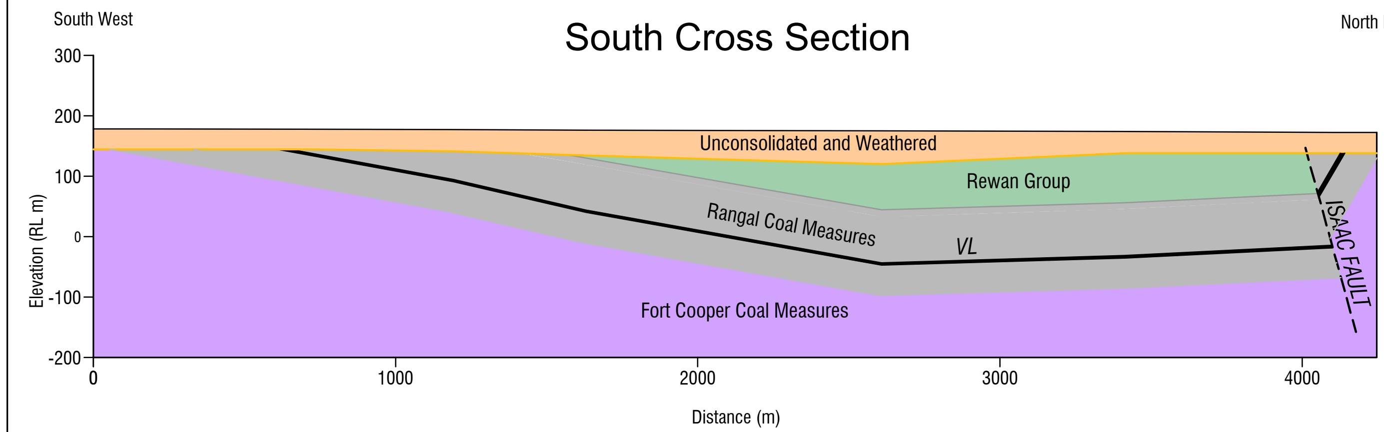
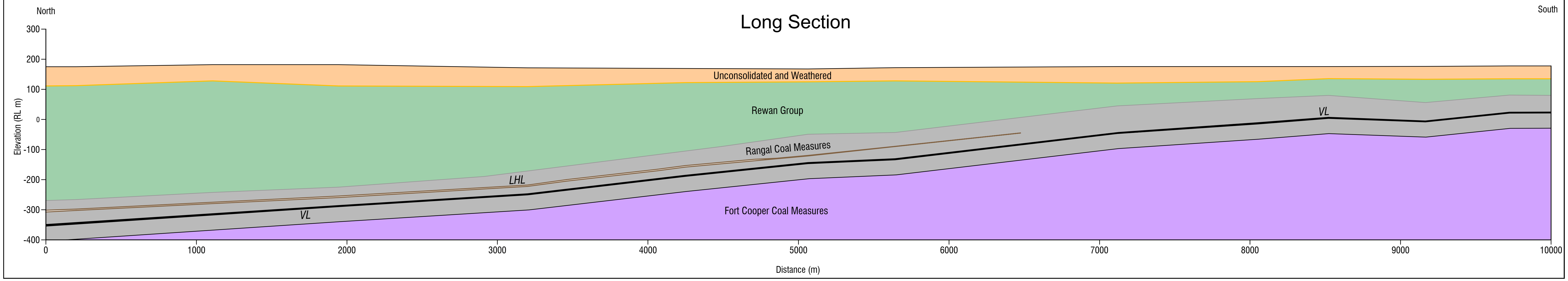
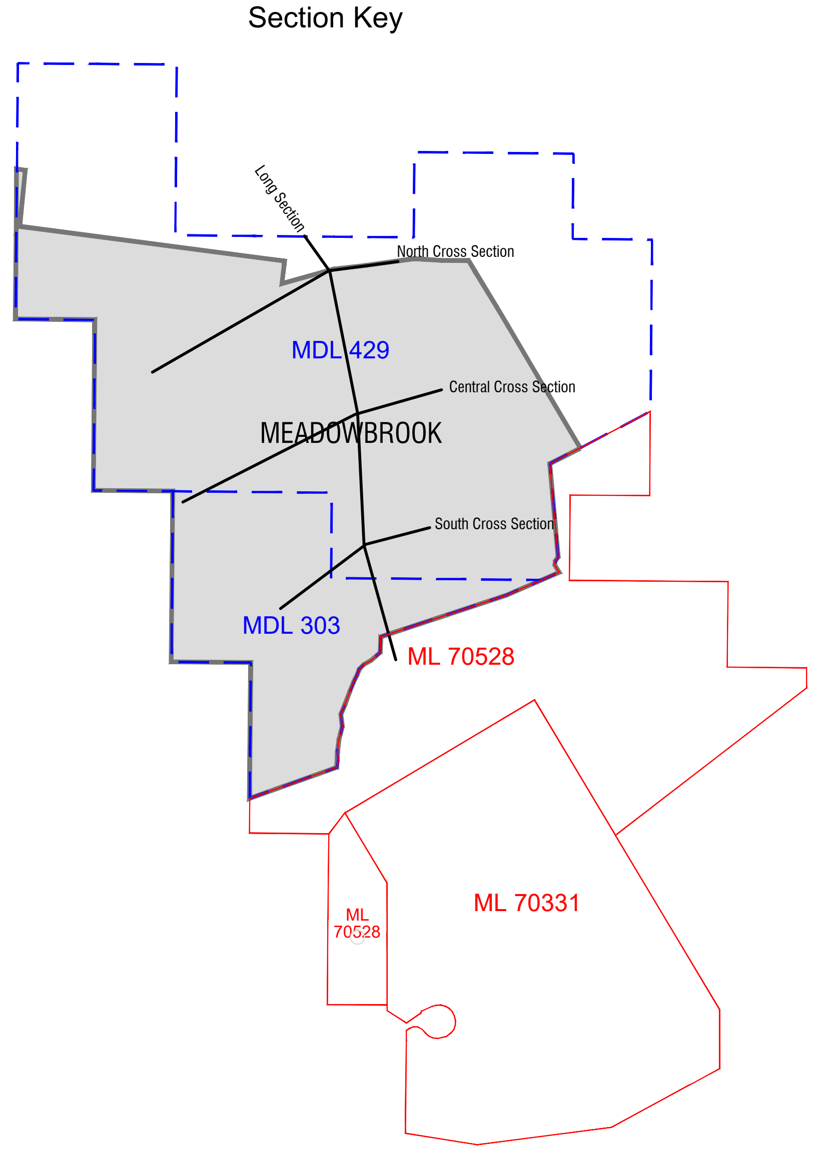










4.2 REGIONAL STRATIGRAPHY

The regional Permo-Triassic stratigraphy comprises, in descending stratigraphic order (Figure 4):

- The Triassic Rewan Group; and
- The Late Permian, Blackwater Group, which can be subdivided into:
  - Rangal Coal Measures
  - Fort Cooper Coal Measures; and
  - Moranbah Coal Measures.

Coal occurs within all three units of the Blackwater Group, but up to the present time has only been mined commercially from the Rangal Coal Measures and the Moranbah Coal Measures. The Moranbah Coal Measures are likely to occur at depths greater than 400m down the western side of Meadowbrook and probably approaching 900m adjacent to the Isaac Fault along the northern boundary of Meadowbrook. They are not presently considered an exploration target.

4.2.1 Rangal Coal Measures

The Rangal Coal Measures, the uppermost coal-bearing unit in the Permian of the Bowen Basin, occupy the stratigraphic interval between the base of the Sagittarius Sandstone, the basal formation of the Rewan Group, and the top of the Yarrabee Tuff Bed, a 0.2m to 1m thick tuff marker that is present over much of the Bowen Basin. At Lake Vermont Mine, the Yarrabee Tuff is typically located 5m to 15m below the basal split of the Vermont seam. However, in the Western Block area it is not readily identified, possibly due to the presence of sandstones at the expected tuff horizon. The Central Block it is typically 15m to 20m below the VL.

The Rangal Coal Measures comprise light grey, fine to medium grained lithic sandstones, grey to dark grey siltstones and mudstones, carbonaceous mudstones, carbonaceous claystones and up to two thick coal horizons: the Leichhardt or Leichhardt Lower seam, and the Vermont seam and its splits.

4.2.2 Fort Cooper Coal Measures

The Fort Cooper Coal Measures are approximately 400m thick, and are characterised by tuffaceous sandstones and siltstones, and several thick, coaly horizons that contain interbedded high-ash coal, carbonaceous mudstone, tuffaceous mudstone, and siltstone. The seams give low yields at high ash and have no current economic potential.

5 EXPLORATION

Exploration in Meadowbrook has comprised both drilling and seismic programs. In addition, an interpretation of regional airborne geophysics around the Lake Vermont Project area was undertaken in 2006.

5.1 DRILLING

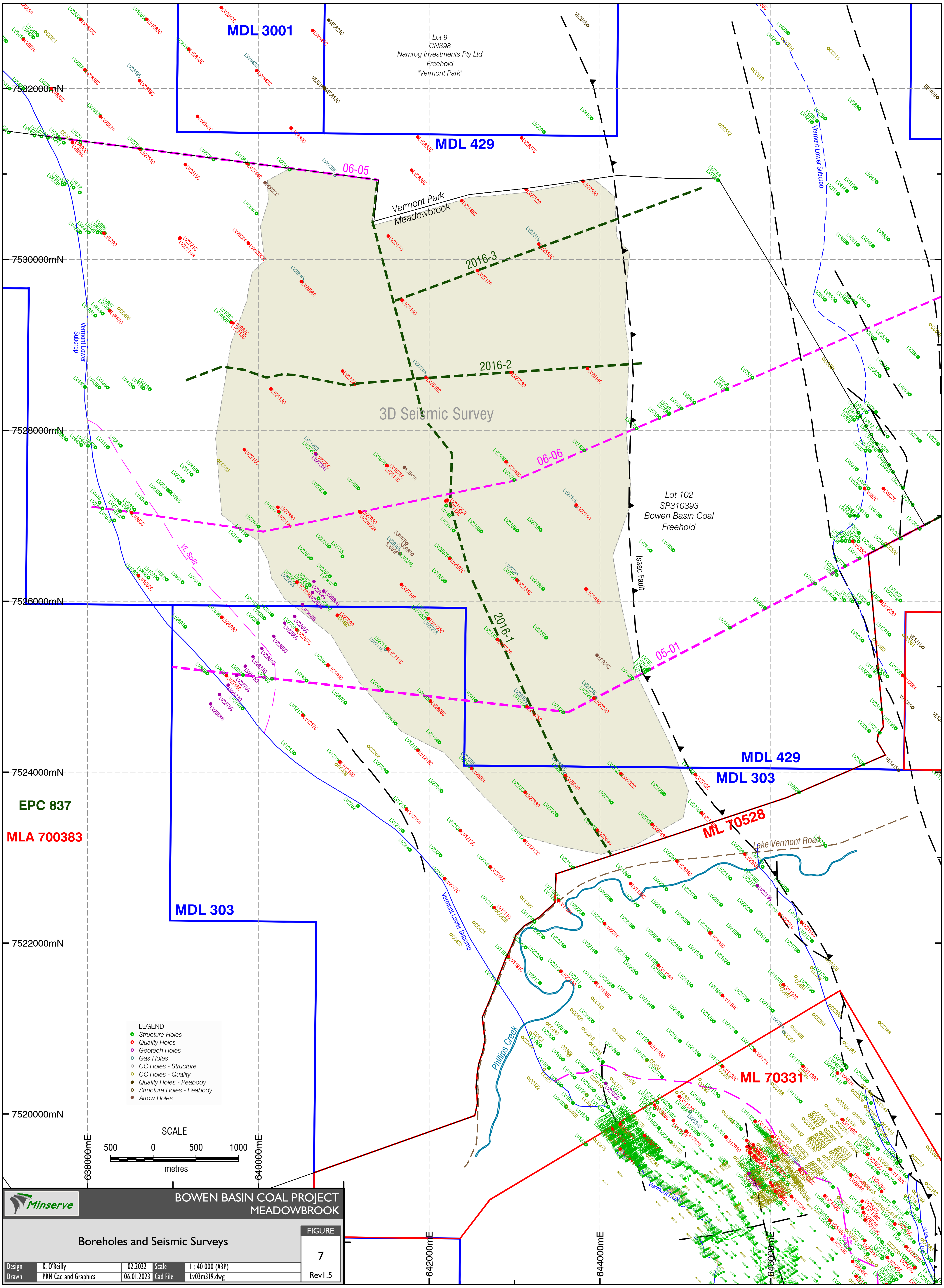
All holes drilled during exploration of Meadowbrook including holes that were not used for the resource estimate because they were not geophysically logged or did not intersect the target seam(s) are shown in Figure 7. The holes include those drilled in ML 70528 and ML 70331 to the south, in MDL 429 and MDL 3001 to the north, in the Isaac Block to the east of the Isaac Fault; and in the Central Block as far east as 648,000mE.

5.1.1 Pre-2008

A number of holes were drilled prior to 2008 in Meadowbrook. Holes with a CC (Cairns County) prefix were drilled by the Department of Mines and Energy between 1982 and 1985 as part of an extensive program of Departmental exploration in the area (Figure 7). The CC holes in the Western Block were mainly drilled to define potential resources of coal along the western crop of the Rangal Coal Measures immediately north of Phillips Creek; and to clarify regional stratigraphy at the northern end of what is now MDL 303 and in MDL 429. The CC holes that were geophysically logged, and for which the logs are available have been used for structural control and as Points of Observation for quantity (volume), unless superseded by more recent holes with higher quality geophysics.

EPC 549 was granted to Bowen Basin Coal in 1994. Drilling was originally concentrated in what are now ML 70331 and ML 70528 south of Phillips Creek. In 1998 and 1999 random scout drilling was undertaken from Phillips Creek to beyond the northern boundary of Meadowbrook, and across the Isaac Block into the Central Block in the search for additional resources of shallow coal. Most of these holes were shallow. Many also terminated above the seams of the Rangal Coal Measures or in the Fort Cooper Coal Measures (Isaac Block).

Additional drilling was carried out in Meadowbrook from 2000 to 2002 (LV313 to LV557C) mainly to define resources in the Western and Central Blocks, but also to investigate the potential for resources in the Isaac Block. Most non-geophysically logged holes have been excluded from modelling. However, unlogged holes that provide useful spatial data on the base of unconsolidated sediments and weathering, the crop of the Vermont Lower seam and the depth to the top of the Vermont Lower seam were retained. Some holes that did not intersect the target coal seams have also been retained for contouring bases of Tertiary and weathering.



MDL 3001
MDL 429
MDL 303
ML 70528
ML 70331
EPC 837
MLA 700383
Lot 9
CNS98
Namrog Investments Pty Ltd
Freehold
"Vermont Park"
Lot 102
SP310393
Bowen Basin Coal
Freehold
Vermont Park
Meadowbrook
3D Seismic Survey
2016-1
2016-2
2016-3
06-05
06-06
05-01
Isaac Fault
VL Split
Vermont Lower Subcrop
Phillips Creek
Lake Vermont Road
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE
LEGEND
Structure Holes
Quality Holes
Geotech Holes
Gas Holes
CC Holes - Structure
CC Holes - Quality
Quality Holes - Peabody
Structure Holes - Peabody
Arrow Holes
SCALE
500
0
500
1000
metres
Minserve
BOWEN BASIN COAL PROJECT
MEADOWBROOK
Boreholes and Seismic Surveys
FIGURE
7
Rev1.5
Design
K. O'Reilly
02.2022
Scale
1 : 40 000 (A3P)
Drawn
PRM Cad and Graphics
06.01.2023
Cad File
Lv03m319.dwg

Holes LV739 to LV768 (Figure 7) were drilled in late 2004/early 2005 during a scout drilling program to test for the presence of upthrown Rangal Coal Measures sediments in the area between the existing crops in the Western Block and the Central Block. LV739 and LV740 were the only holes drilled deep enough to intersect the Vermont Lower seam in the Western Block. However, several holes in the upthrown Isaac Block, including partly cored, quality holes LV767 and LV768 intersected the Vermont Lower seam at shallow depths. Holes LV739, LV740, LV761, LV767 and LV768 from this program were geophysically logged, but the other holes, which all terminated in Rewan Group sediments were not logged. Unlogged holes have been used to help control the base of unconsolidated sediments and base of weathering.

Holes LV857 to LV876 and LV887C to LV890C (Figure 7) were drilled and geophysically logged in 2006 during a program to prove up shallow coal resources in the Western Block of MDL 429 and the north-western corner of MDL 303. The Holes were drilled on generally east-west trending lines, from 800m south of the MDL 303/MDL 429 boundary to north of Meadowbrook and were generally less than 140m deep. Coal seams were cored (HMLC – 63mm diameter) and sampled for analysis from LV887C to LV890C (Figure 7).

Holes LV863C, LV867C and LV870C and LV1075 to LV1086 were drilled in the Western Block of Meadowbrook in 2008 during a program designed to raise shallow coal resources to Indicated status and to provide data for an initial underground resource estimate. The holes were geophysically logged, and, along with older reliable drillholes were used to prepare an initial estimate of Resources in the Western Block of MDL 429 in Meadowbrook and Vermont Park (O'Reilly, 2009).

5.1.2 Drilling 2010 to 2013

Drilling carried out in Meadowbrook in 2010 was the first time that the north-western section of MDL 303 had been systematically drilled to define potential resources in the Western Block. Holes LV1188 to LV1191, including quality holes LV1188C/LV1188R and LV1189C, were drilled along the southern boundary of Meadowbrook and holes LV1211 to LV1219, including quality holes LV1211C to LV1213C, LV1215C to LV1217C and LV1219C were drilled to define potential open cut and shallow underground resources in the MDL 303 part of Meadowbrook. At the completion of this program Points of Observation for resource estimation were less than 1km apart and an initial resource estimate for MDL 303 in the area north of ML 70331 was prepared by John Thrift of Xenith Consulting. The estimate included resources in what is now ML 70528, as well as resources in Meadowbrook.

Exploration carried out in the Central Block up to 2002 had defined a zone of resources of the Rangal Coal Measures within and adjacent to the eastern boundary of Meadowbrook. Additional drilling was carried out in the Central Block between January and November 2010 to allow resources to be estimated for the whole Central

Block. Thirty-three, holes, including 10 partly cored holes were drilled over potential open cut resources during the program; but only 10 of these (LV1198 to LV1205, LV1200C and LV1202C) were drilled in the Central Block adjacent to Meadowbrook (Figure 7).

An initial resource estimate for Lake Vermont East, including resources in the Meadowbrook part of the Central Block was prepared in December 2010 after the conclusion of this round of drilling (O'Reilly, 2010).

In late 2012 and in 2013 a program of drilling was carried out with the aim of raising resources in the Western Block of MDL 303 south of Phillips Creek (now ML 70528) to Measured status. As part of this program four holes (LV2393/2393C and LV2394/2394C) were drilled at two sites along the Lake Vermont Road just south of Meadowbrook. Following this drilling, an updated resource estimate was prepared for MDL 303 (now split into ML 70528 and MDL 303 northwest) north of ML 70331 and west of the Isaac Fault (O'Reilly, 2013).

Drilling to the east of the Isaac Fault in 2013 was located at the southern end of the Central Block and in the Eastern Block. There was no additional drilling in or adjacent to Meadowbrook. As a result, there was no change relative to the 2013 estimate to the resources in Meadowbrook when an updated resource estimate was prepared in 2020 (O'Reilly, 2020) for the areas east of the Isaac Fault.

In addition to the Lake Vermont holes, Arrow Energy drilled geophysically logged holes PD022C, NP004C, SJ007F, SJ008F, SJ009F and SJ049C in the Meadowbrook Underground area between 2010 and 2012 (Figure 7). SJ007F to SJ009F were drilled in a triangular pattern approximately 150m apart from each other as part of a program to measure lateral increases in coal permeability after hydraulic fracturing. The program was suspended after the holes had been drilled, but prior to hydraulic fracturing.

5.1.3 Drilling 2015 to 2016

In 2015/2016, 24 geophysically logged holes (LV2503 to LV2530R) were drilled at 17 sites in Meadowbrook (Figure 7) west of the Isaac Fault with the aim of raising resources in Meadowbrook to Indicated status. Coal quality data were obtained from each of the 17 sites. As a result of this drilling new resource estimates for ML 70528, MDL 303, MDL 429 and MDL 3001 west of the Isaac Fault (Lake Vermont Northwest) were prepared (O'Reilly, 2017).

5.1.4 Drilling 2020 to 2021

Following on from the exploration in 2015 and 2016, Lake Vermont Resources approved a full pre-feasibility underground exploration program, comprising infill drilling, and 3D seismic. At the same time the company gained access to Vermont Park property and was able to carry out an exploration program to improve confidence in the resources at the northern end of the Meadowbrook Underground area.

A total of 169 holes were drilled over the two-year program, in and to the north of Meadowbrook comprising:

- 134 holes for structure/stratigraphy, coal quality and rock strength
- 20 holes primarily for the assessment of seam gas quantity and composition, but also for permeability and horizontal stress studies; and
- 15 holes specifically for collection of samples for geotechnical assessment.

At the completion of the 2021 exploration program there were 402 holes in and around the Western Block of Meadowbrook available for use in modelling the project and estimating resources. Because there were often two and up to four holes at a site only the most representative hole at each site was chosen for inclusion in the structural model.

5.2 SURVEY

All holes used for modelling were accurately surveyed. As a check on the accuracy of the RLs, the surveyed RLs for the holes used in the model (one hole at each site) were compared with the RLs obtained from the LIDAR data. In the Western Block the surveyed RLs were up to 1m different from the LIDAR data, both higher and lower (Appendix A1) and a review of the differences showed there was generally a consistency in the differences for different drilling campaigns. In the Central Block the surveyed RLs from most drilling programs were within 1m of the LIDAR RLs (Appendix A2). However, the RLs of the LV300 to LV500 series holes were typically 2.5m to 4m higher than the LIDAR value. To ensure consistency of the RLs between different drilling programs the LIDAR RL has been used for each site rather than the surveyed RL.

5.3 SEISMIC

5.3.1 2D Seismic Programs

One Mini-SOSIE seismic line (2005-1) was recorded across the southern part of Meadowbrook in 2005 to trial the applicability of the method in an area of deep weathering. Following this trial, six new lines were recorded across MDL 429, MDL 303 and ML 70331 in 2006, including two more lines (2006-5 and 2006-6) across the northern and central parts of Meadowbrook, providing good information on coal seam continuity and structure (Figures 7, and 8 – 2x vertical exaggeration).

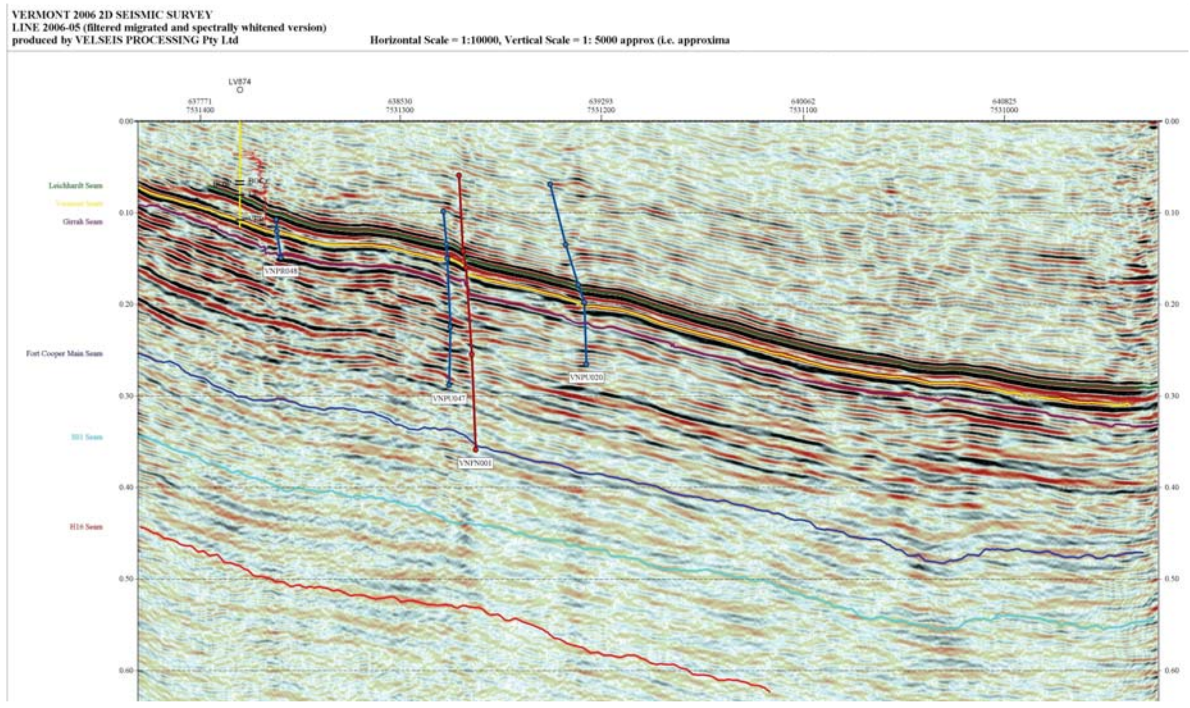
Three more Mini-SOSIE lines (Figures 7 and 9 – 4x vertical exaggeration) to help define structure and confirm coal seam continuity, were recorded and processed in the Meadowbrook Underground area in 2016: two generally west to east (2016-2 and 2016-3), and the other NNW-SSE (2016-1).

5.3.2 3D Seismic Program

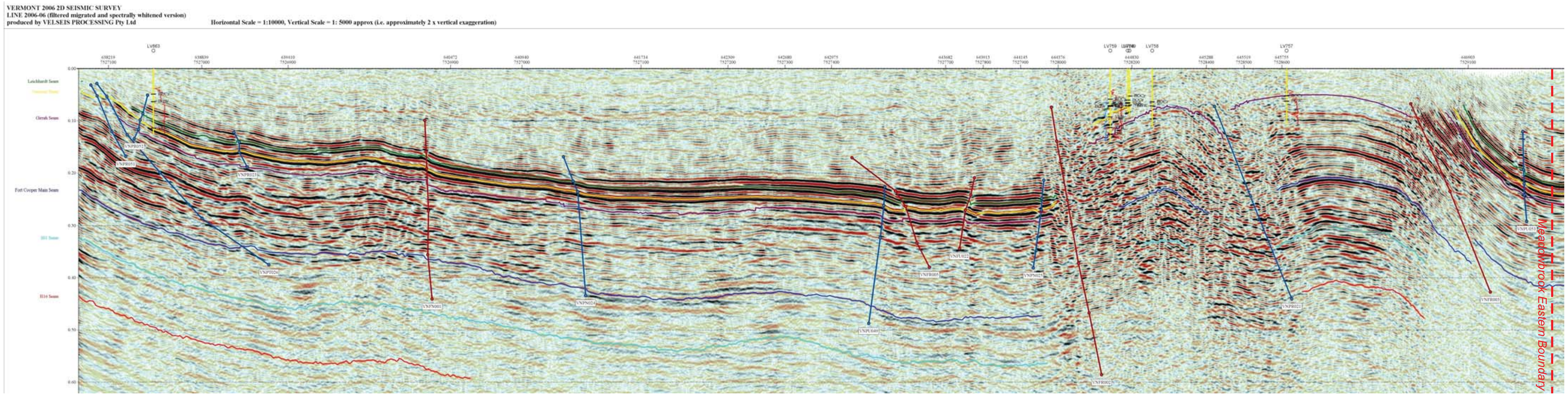
During 2020 Velseis recorded, processed, and interpreted a 3D seismic program over the proposed Meadowbrook Underground in two stages. Velseis acquired stage 1 during May 2020; and stage 2, north of stage 1, during October/November 2020. After the two-stage acquisition, the volumes were processed and merged during November and December 2020. The final merged volume was approximately 22km^2 (Figure 7). Data quality was excellent, with the 3D dataset allowing for structures to be accurately defined and characterised across the study area.

Although seismic data are not considered Points of Observation for the purposes of resource estimation, they are considered Interpretive Data, which support the existence and/or continuity of coal seams by indirect methods. Therefore, although they cannot be used to estimate coal quantity or quality, they can be used in conjunction with Points of Observation to improve confidence in seam continuity and the structural interpretation of a deposit.

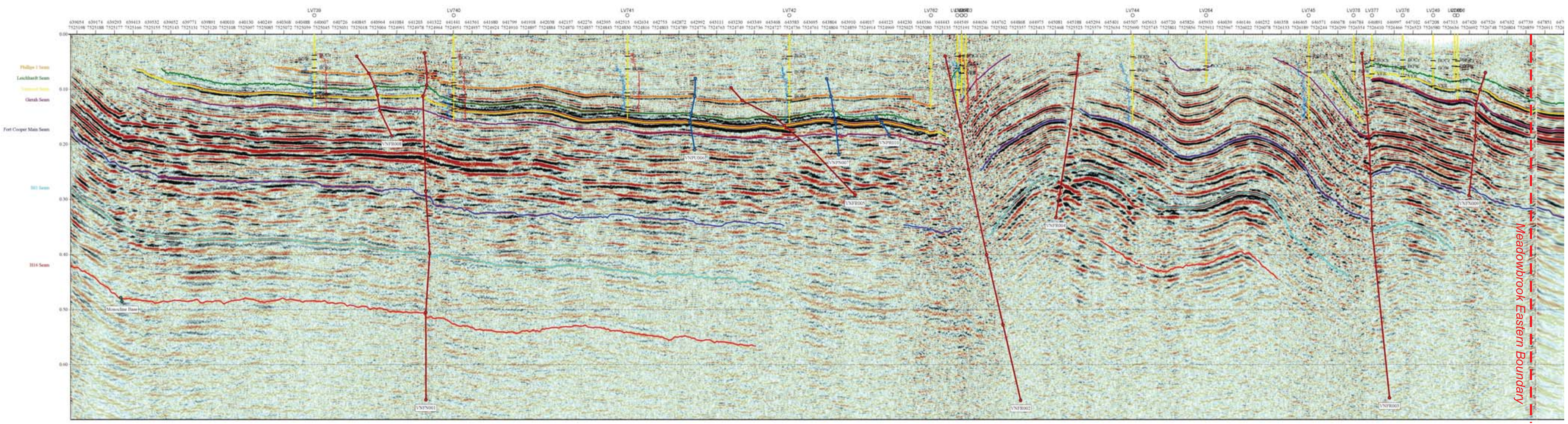
2006-05



2006-06

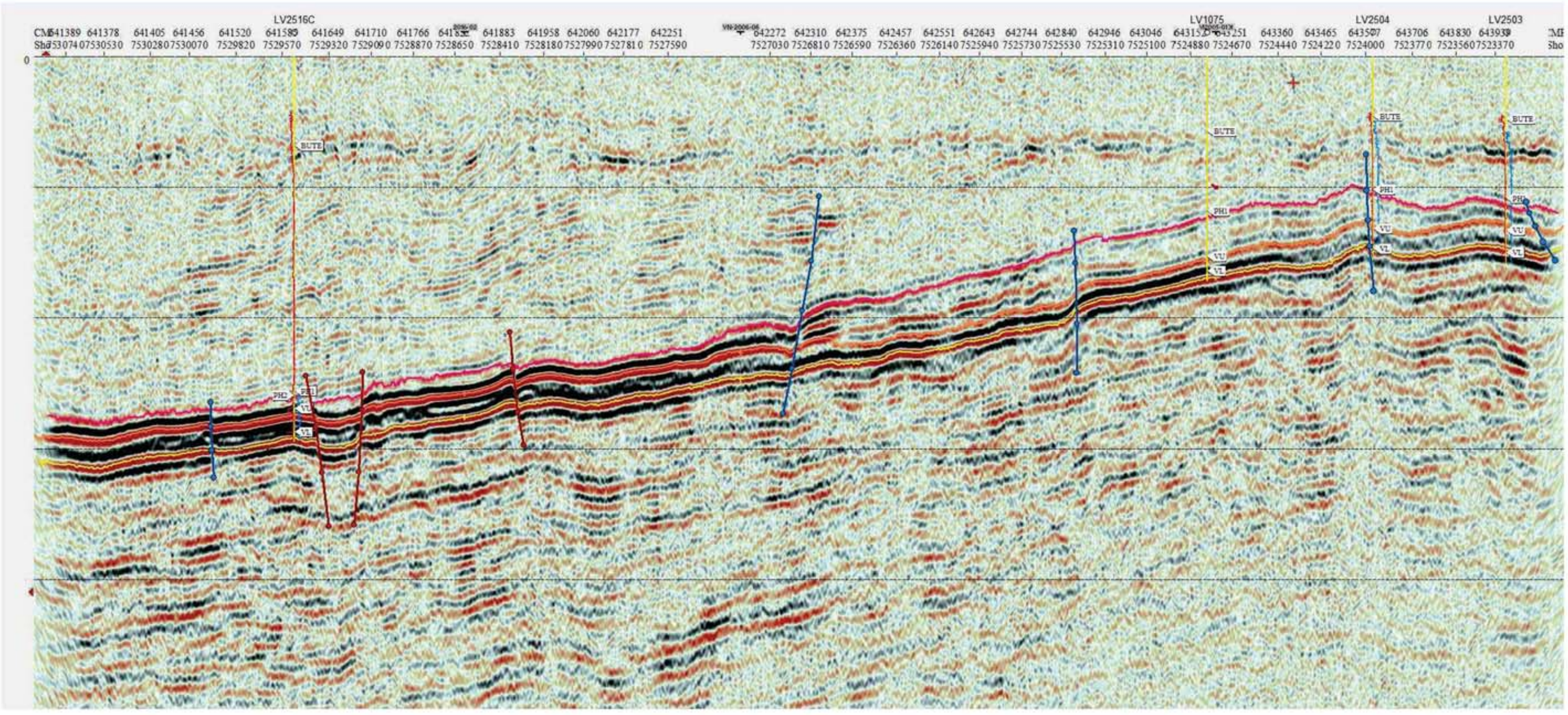


2005-01

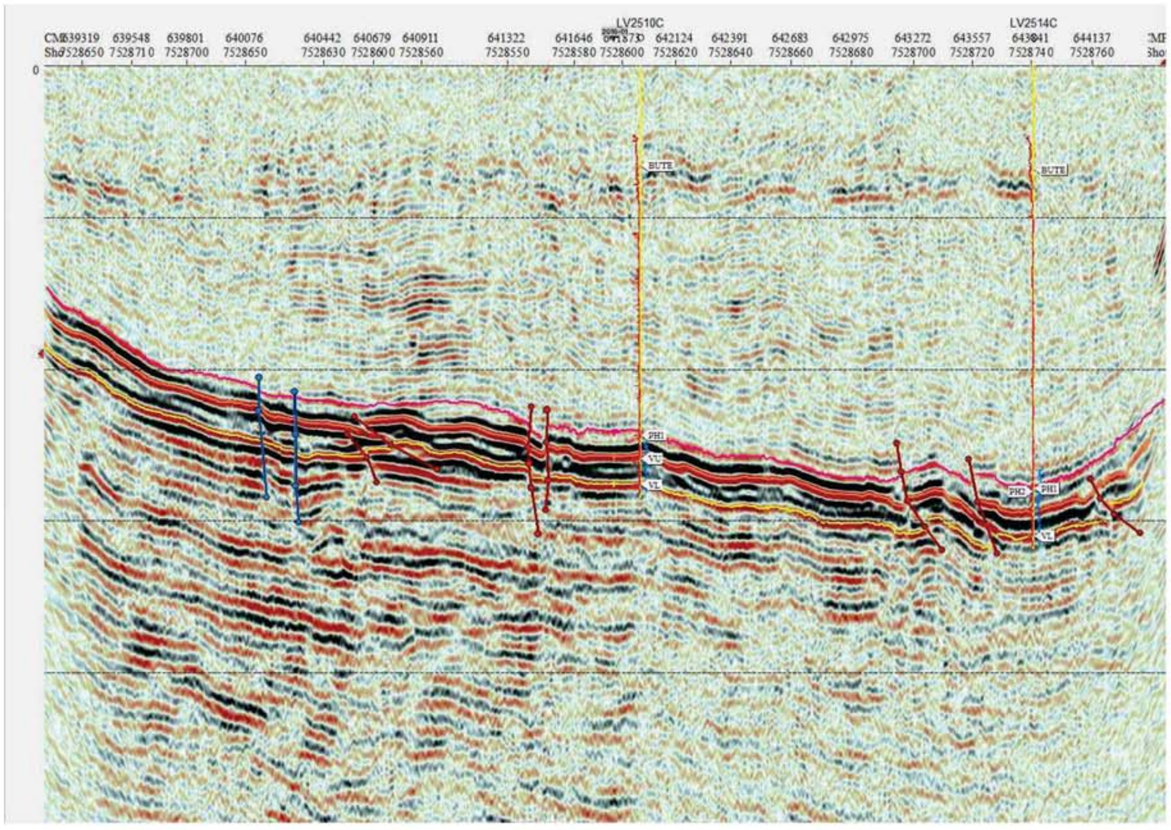


Minserve	BOWEN BASIN COAL PTY LTD Lake Vermont Northwest		
Seismic Sections 2005/2006			FIGURE 8
Design	K.W.O'Reilly	01.2023	Scale NTS
Drawn	The MINSERVE Group	03.01.2023	Cad File Lv03m321.cdr
			Rev 1.0

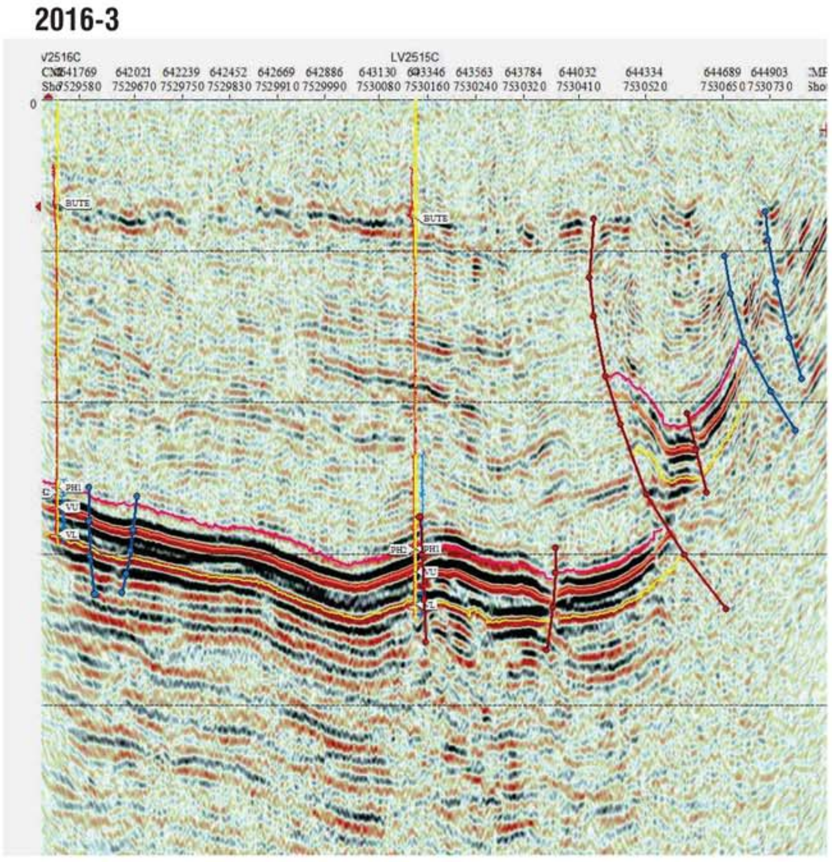
2016-1



2016-2



2016-3



Minserve

BOWEN BASIN COAL PTY LTD
MEADOWBROOK

Seismic Sections 2016

FIGURE
9

Design	K.W.O'Reilly	02.2022	Scale	NTS	
Drawn	The MINSERVE Group	18.02.2022	Cad File	Lv03m321.cdr	Rev 1.2

6 LOCAL GEOLOGY

Coal resources in Meadowbrook occur in the Rangal Coal Measures in the Western Block and the Central Block. In the Western Block resources occur between the crop of the Vermont Lower seam in the west and the Isaac Fault to the east, from depths of 30m to 50m near the crop of the Vermont Lower seam to more than 550m depth in the north-eastern corner of the deposit, adjacent to the Isaac Fault (Figure 10).

In the Western Block south of and just north of Phillips Creek in ML70528 a drag syncline caused by the Isaac Fault results in the economic coal seams cropping again immediately west of the fault. However, the effect dies out to the north and based on the borehole data and 3D seismic, the depth to the Vermont Lower seam on the footwall of the Isaac Fault increases to approximately 175m adjacent to the northern boundary of MDL 303 and approximately 550m adjacent to the northern boundary of Meadowbrook. The overburden contour plan for the Vermont Lower seam (Figure 10) merges the overburden in the 3D seismic area where 484,000 two-way travel time records were converted to depths; and the overburden outside the 3D seismic area, which is gridded from validated data points.

In the Central Block, resources occur between the crop of the Vermont Lower seam in the west and: the Meadowbrook boundary to the east (north), a west side up fault at approximately 125m depth to the Vermont Lower seam in the middle; and the boundary with ML 70528 (also the boundary of Lake Vermont property) in the south (Figure 10). Depths to the Vermont lower seam at the crop are typically 30m to 50 in the north and middle parts of the resource area, but in the south the seam is truncated against a large reverse fault at overburden depths of approximately 75m.

The local stratigraphy and structure have been defined by the exploration drilling and seismic carried out over the past forty years. Between two and four holes were drilled at many of the sites in the Western Block during different programs or for different purposes and in most cases the straighter, most representative hole has been used for seam depth and thickness contouring. Borehole summary data for the holes used to generate the model for resource estimates are presented in Appendix A1 (Western Block) and Appendix A2 (Central Block). Seam intersections with obviously anomalous thicknesses (weathered, intruded/coked or fault affected) have been excluded from thickness contours and volume calculations.

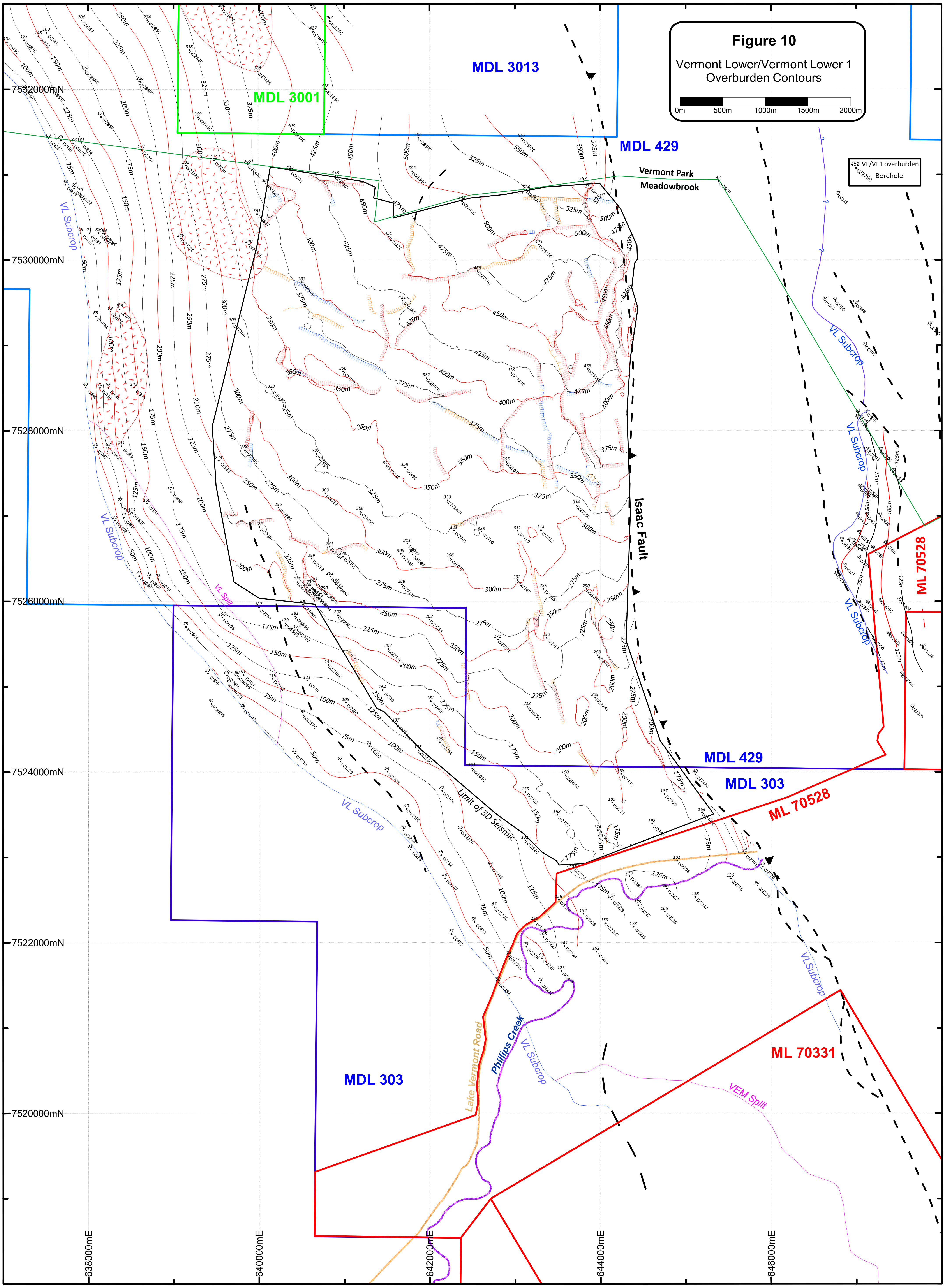


Figure 10
Vermont Lower/Vermont Lower 1 Overburden Contours
0m
500m
1000m
1500m
2000m
452 VL/VL1 overburden
LV2750 Borehole
MDL 3013
MDL 3001
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
Limit of 3D Seismic
VL Subcrop
VL Split
VEM Split
Phillips Creek
Lake Vermont Road
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

6.1 STRATIGRAPHY

Stratigraphic units present in Meadowbrook are summarised in Table 1 and for the Western Block, in Figure 11.

Table 1 — Deposit Stratigraphy

Age	Group	Unit	Lithology
Cainozoic		Unnamed	Mainly unconsolidated sand and clay alluvial deposits
Triassic	Rewan Group	Sagittarius Sandstone	Mainly brick red siltstones and mudstones and greenish-grey siltstones and sandstones
Late Permian	Blackwater Group	Rangal Coal Measures	Grey labile sandstone and siltstone, mudstone, carbonaceous mudstone and coal
		Fort Cooper Coal Measures	Grey labile tuffaceous sandstone and siltstone, mudstone, tuffaceous mudstone, carbonaceous mudstone and coal

6.1.1 Cainozoic and Weathering

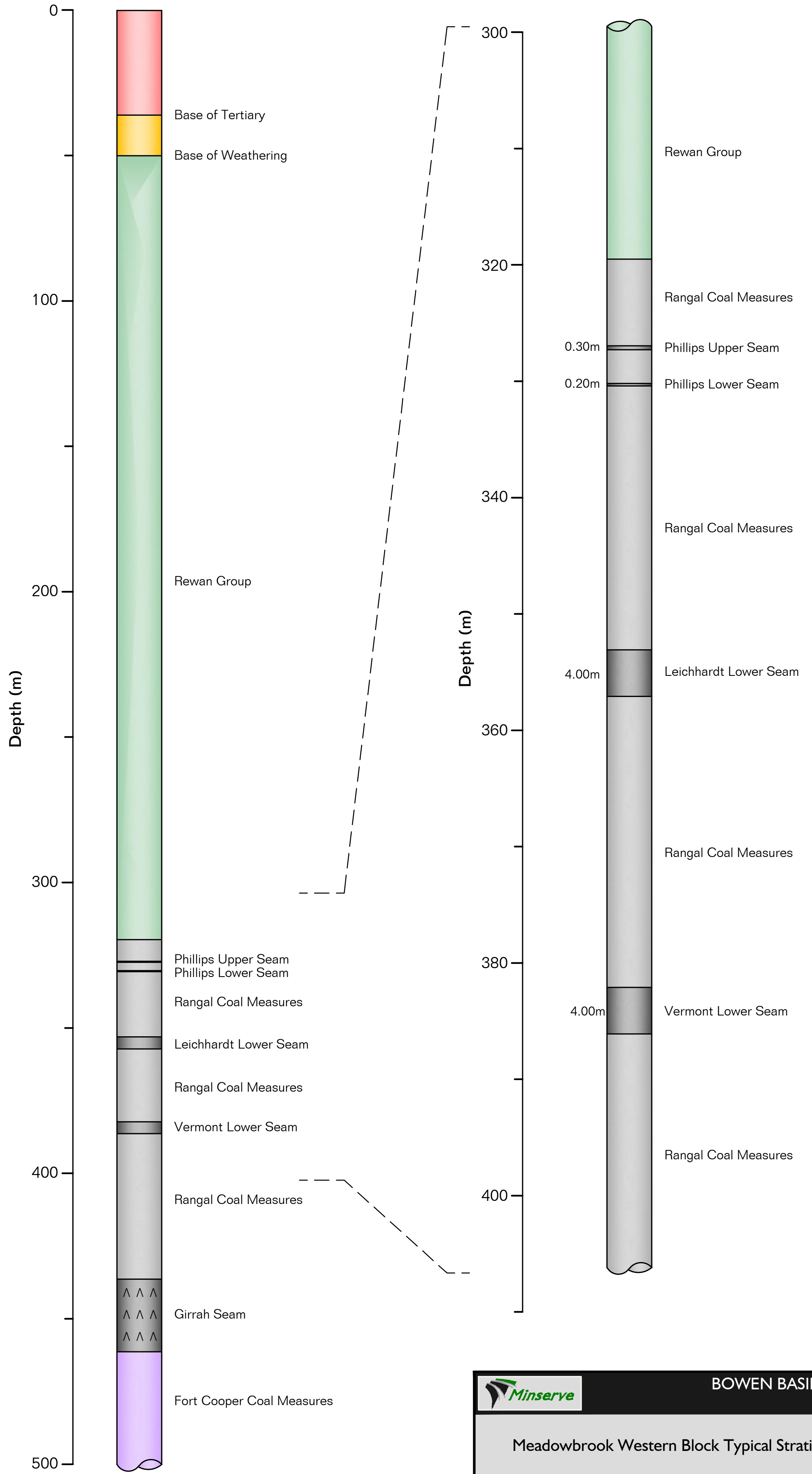
The thickness of Cainozoic sediments intersected in the Western Block is variable, ranging from 5m to 80m and averaging 28m. However, interpretation of the base of the Cainozoic is subjective and is much deeper in Arrow hole PD022C (80m) than in any Lake Vermont hole. The Cainozoic mainly comprises alluvial sands, clayey sands and clays, with a basal layer of sand and gravel from abandoned channels of the various creeks. The average thickness of the Cainozoic in the Central Block, which also comprises sands, clayey sands and clays, with a basal layer of sand and gravel, is 33m.

The base of weathering in the Western Block ranges from 23m to 90m and averages 49m. However, the deeper weathering is from holes in MDL 429 along the northern boundary of Meadowbrook where the depth of weathering increases to more than 70m (Figure 12). The depth of weathering along the crop line of the Vermont Lower seam is typically 25m to 40m in the south of Meadowbrook and 50m to 60m in the north.

The depth of weathering ranges from 20m to 80m and averages 50m in the Central Block (Figure 12). The depth of weathering along the crop line of the Vermont Lower seam is consistently less than 30m in the middle part of the Central Block but increases to more than 50m to the north and south (Figure 12). However, in the south resources are limited to the west by faulting rather than weathering.

6.1.2 Sagittarius Sandstone

Sediments of the 250m to 300m thick Sagittarius Sandstone, the basal formation of the Rewan Group, occur beneath the Cainozoic sediments over most of the Western and Central Blocks. The formation typically contains approximately equal proportions of greenish grey sandstones, and siltstones and greenish grey and chocolate mudstones. The basal 150m is lithologically similar to the underlying Rangal Coal Measures; but is differentiated by the greenish tinge of the sediments and the absence of coal.



BOWEN BASIN COAL PTY LTD
MEADOWBROOK

Meadowbrook Western Block Typical Stratigraphy

FIGURE 11

Design	K. O'Reilly	11.2021	Scale	(A4P)
Drawn	PRM Cad and Graphics	04.01.2023	Cad File	Lv03m301.dwg

Rev.1.6

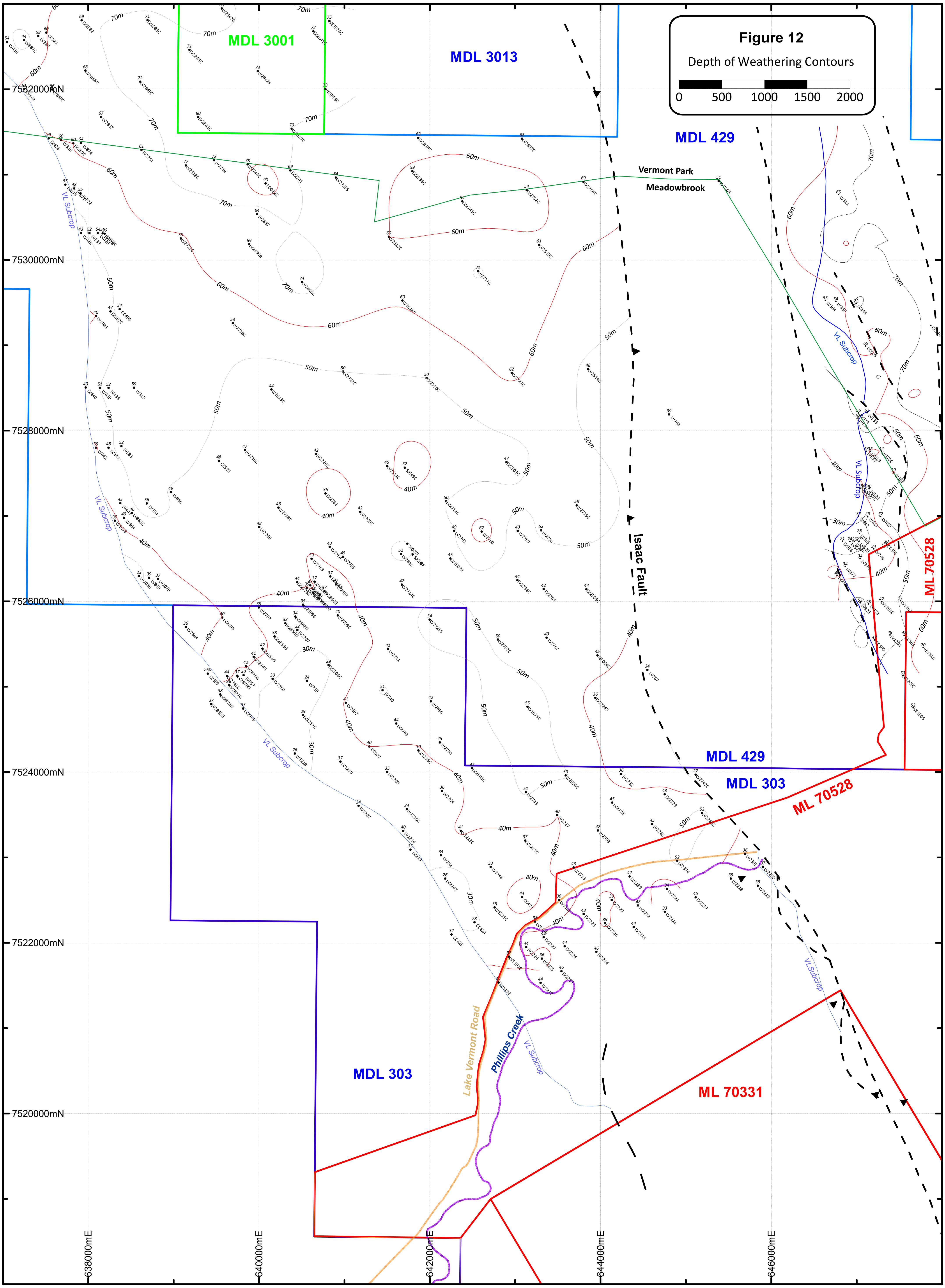


Figure 12
Depth of Weathering Contours
0 500 1000 1500 2000
MDL 3001
MDL 3013
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
VL Subcrop
Lake Vermont Road
Phillips Creek
70m
60m
50m
40m
30m
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

The base of the Sagittarius Sandstone is marked by the presence of a dark grey, 1m to 3m thick, high gamma, occasionally carbonaceous mudstone bed at the top of the Rangal Coal Measures. It can be recognised in most holes due to its dark colour and high natural gamma count but is not always present, probably due to erosion by overlying sandstone. It is a significant stratigraphic marker unit in Lake Vermont Northwest and elsewhere throughout the northern Bowen Basin.

6.2 COAL SEAM GEOLOGY

Potentially economic coal within Meadowbrook occurs within the Late Permian Rangal Coal Measures. Persistent, thick coal horizons within the Rangal Coal Measures, in descending stratigraphic order, are the:

- Leichhardt seam (LH)
- Leichhardt Lower seam (LHL); and
- Vermont Lower seam (VL).

One other thin, persistent seam, the Phillips Upper seam (PH1) is present within the Rangal Coal Measures throughout the Western Block (Figure 11). The PH1 comprises 0.1m to 0.3m of inferior coal in MDL 303 but improves in quality and thickens to between 0.3m and 0.5m in MDL 429. The PH1 is located 2m to 10m below the base of the Rewan Group and 5m to 10m above the Leichhardt seam in MDL 303 and in the areas of the Western Block where the remnant Leichhardt seam can be recognised. In the north-eastern corner of the Western Block, adjacent to the Isaac Fault, the PH1 coalesces with the underlying and much less persistent Phillips Lower seam (PH2) to form the 0.8m to 0.9m thick Phillips seam (PH).

In the Western Block the interburden between the PH1 and the LHL is typically 20m to 40m but the interburden increases to between 50m and 60m at the south-eastern limit of the LHL. Although the PH1 has no economic significance, it is a useful stratigraphic marker, especially in the area between the northern end of ML70528 and the southern end of MDL 429 where the LH and the LHL have deteriorated to remnant coaly/carbonaceous horizons.

Several other thin seams of no economic significance were intersected from time to time in the Western Block, the most persistent being the Vermont Rider seam (VR) a 0.2m to 0.8m thick seam of high ash coal, typically located less than 2m above the VL in MDL 429.

6.2.1 Leichhardt Seam

The LH has been intersected at depths ranging from 26m to 144m in the southern part of the Western Block where it has some economic potential (Figure 13). However, in most intersections where the seam was less than 40m deep it was weathered. Dips are relatively steep (5^o to 10^o near the crop) but flatten out at the base of the syncline at depths of 110m to 145m.

The LH is 2m to 2.2m thick in the southwestern and north-eastern corners of MDL 303 but generally thins and deteriorates to the north and west (Figure 14). The LH Effective Limit line marks where there is at least 1m of high-quality coal. Even though the seam is approximately 2m thick along this line, the upper 1m comprises interbanded high-ash coal and mudstone. In LV2728 the high-ash upper ply has split from the seam leaving only the 1m of higher quality coal.

North of this Effective Limit line the LH deteriorates rapidly but can be recognised as a stratigraphic horizon, usually comprising less than 1m of inferior coal and carbonaceous mudstone, for 4km to 5km further north (Figure 14). Interburden thickness between the LH and the underlying VL is approximately 45m along the MDL 303/ML 70528 boundary but thickens to between 50m and 60m near the effective limit of the LH (Figure 15). Further north, as the LH continues to thin and deteriorate, the interburden thickens to more than 70m.

The LH has an irregular distribution in the Central Block of Meadowbrook and where it does occur it is generally less than 1m thick with no economic potential. Southeast of Meadowbrook, in EPC 850 held by Peabody the LH thickens to more than 2m and maintains a consistent thickness of around 2m throughout the Central Block of ML70528 to the south of EPC 850.

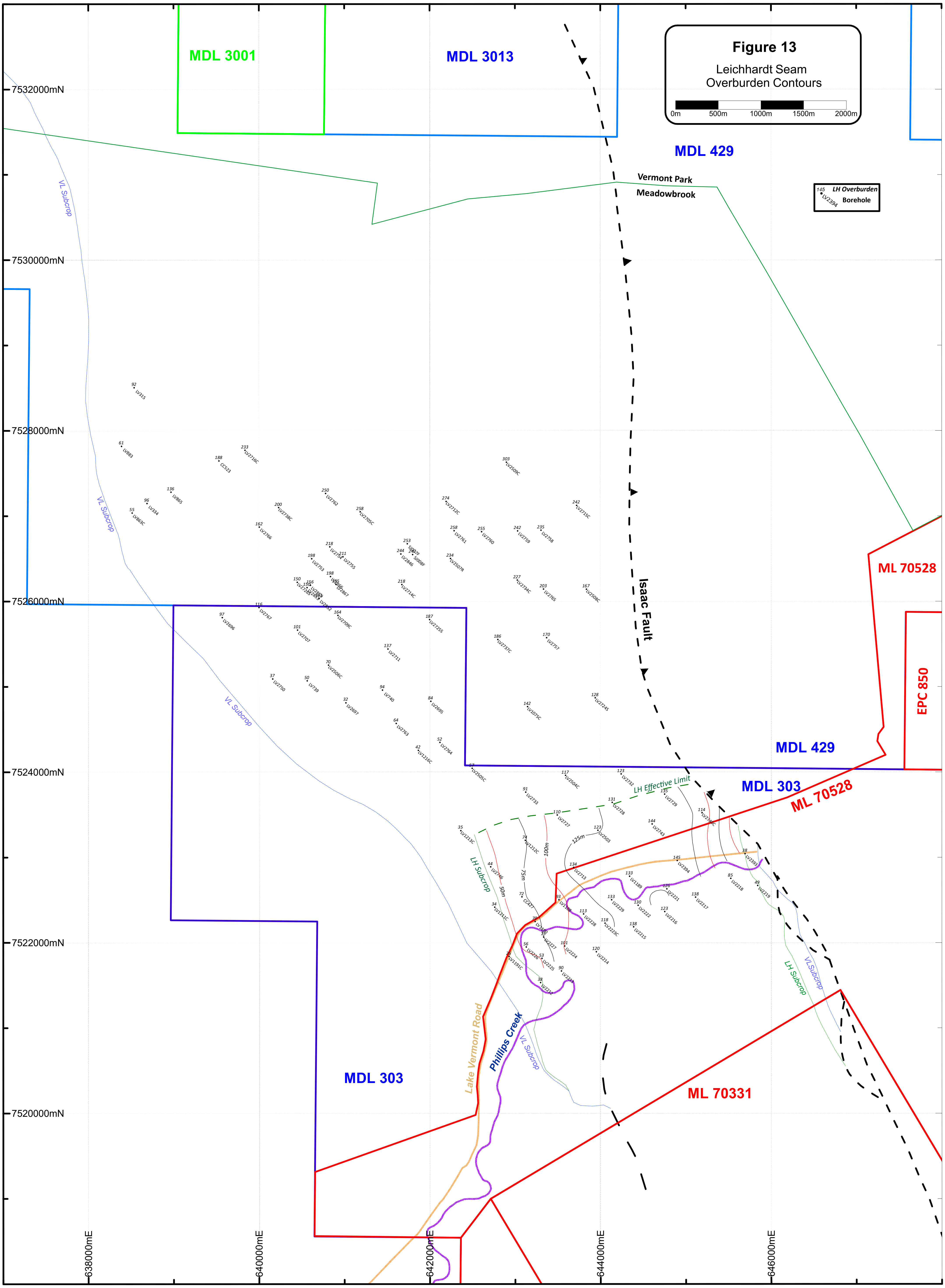


Figure 13
Leichhardt Seam
Overburden Contours
0m
500m
1000m
1500m
2000m
MDL 3001
MDL 3013
MDL 429
Vermont Park
Meadowbrook
145
LV2394
LH Overburden
Borehole
Isaac Fault
ML 70528
EPC 850
MDL 429
MDL 303
ML 70528
LH Effective Limit
LH Subcrop
VL Subcrop
Lake Vermont Road
Phillips Creek
MDL 303
ML 70331
125m
100m
75m
50m
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

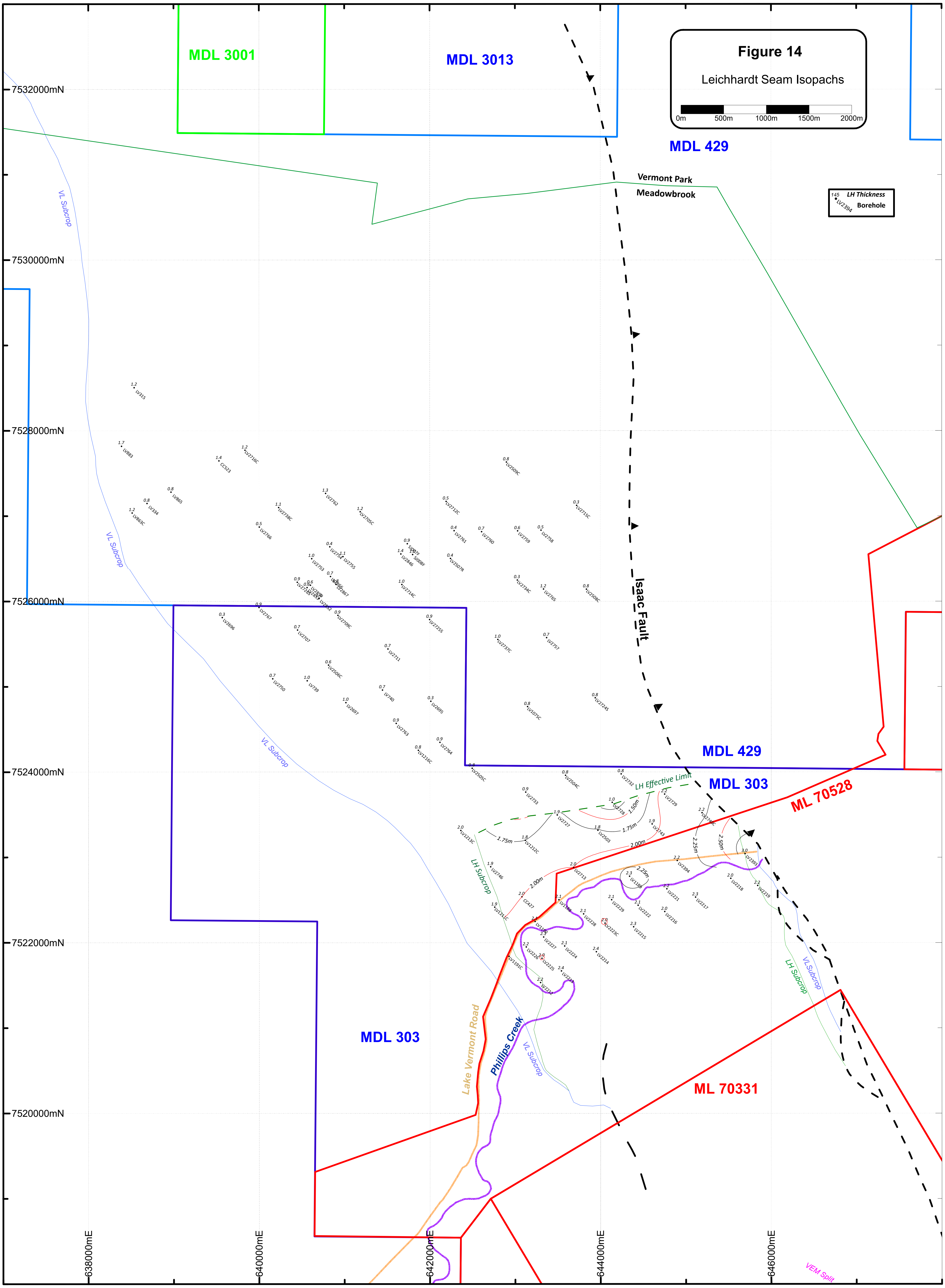


Figure 14
Leichhardt Seam Isopachs
0m
500m
1000m
1500m
2000m
LH Thickness
Borehole
MDL 3001
MDL 3013
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
VL Subcrop
LH Subcrop
LH Effective Limit
Lake Vermont Road
Phillips Creek
VEM Split
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

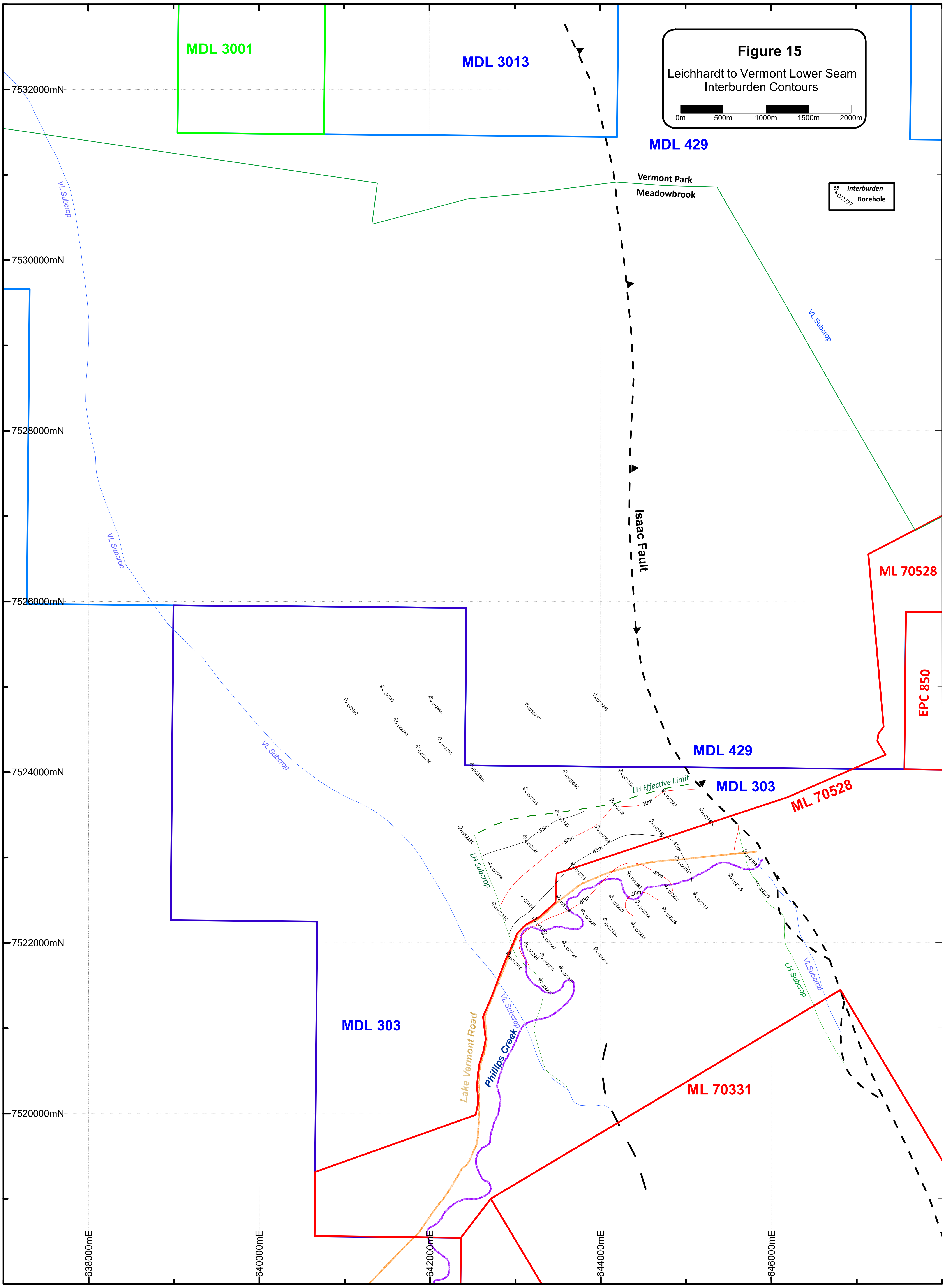


Figure 15
Leichhardt to Vermont Lower Seam Interburden Contours
0m
500m
1000m
1500m
2000m
MDL 3001
MDL 3013
MDL 429
MDL 303
ML 70528
ML 70331
EPC 850
Vermont Park
Meadowbrook
Isaac Fault
VL Subcrop
LH Subcrop
LH Effective Limit
Lake Vermont Road
Phillips Creek
Interburden
Borehole
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

6.2.2 Leichhardt Lower Seam

As the Leichhardt seam thins and deteriorates northwards within MDL 303 in the Western Block, the LHL develops below it. Initially the LHL occurs as a coaly/carbonaceous horizon with no economic potential, but it gradually thickens and improves towards the north. In some of the southern holes it occurs as two thin, clean coal seams, but in most southern holes it appears as a single seam that thickens and improves northwards.

In the south, the LHL attains a mineable quality at approximately 2m thickness along a line termed the LHL Effective Limit (Figure 16). To the south and west of this line the seam has no economic potential. To the north the seam thickens and improves rapidly and in the area to the east of 640,000mE and north of 7,528,000mN it is consistently 3.5m to 4.5m thick. In the potential LHL underground area the LHL is 3m to 5m thick apart from a small area in the south-eastern corner of the underground where the thickness drops below 2m due to localised seam splitting. The LHL thins to the west, and over most of the potential open cut area it is 2m to 3.5m thick.

The LHL has been intersected in the Western Block at depths ranging from 38m to 60m near the western crop line to between 510m and 520m in the northeast, adjacent to the Isaac Fault (Figure 17). However, the seam was weathered whenever it was intersected at less than 50m depth. The overburden contour plan for the LHL in the Western Block (Figure 17) merges the overburden in the 3D seismic area where 387,000 two-way travel time records were converted to depths; and the overburden outside the 3D seismic area, which is gridded from validated data points. The faults shown on the plan are from the interpretation of the 3D seismic but are limited to faults with throws consistently greater than seam thickness.

The interburden between the LHL and the VL seam in the Western Block of Meadowbrook is typically 20m to 40m (Figure 18).

In the Central Block the LHL has to date been correlated with the Vermont Upper seam (VU). However, the seam thickness and stratigraphic location suggest it is equivalent to the LHL from the Western Block and has been so named herein. In the Central Block, the LHL has been intersected at depths ranging from 19m (weathered) to 137m, mainly to the south of 7,528,000mN (Figure 17). The seam thins from more than 2m in the north to only 1m to 1.5m in ML 70528 (Figure 16), in much the same way as the LHL thins in the Western Block. To avoid confusion in a very congested plan the hole numbers have been left off the Central Block data points.

Interburden thickness between the LHL and the underlying VL in the resource area of the Central Block thins from 30m in the north to 25m in ML 70528 and 20m in EPC 850 (Peabody) before the LHL shales out further south (Figure 18).

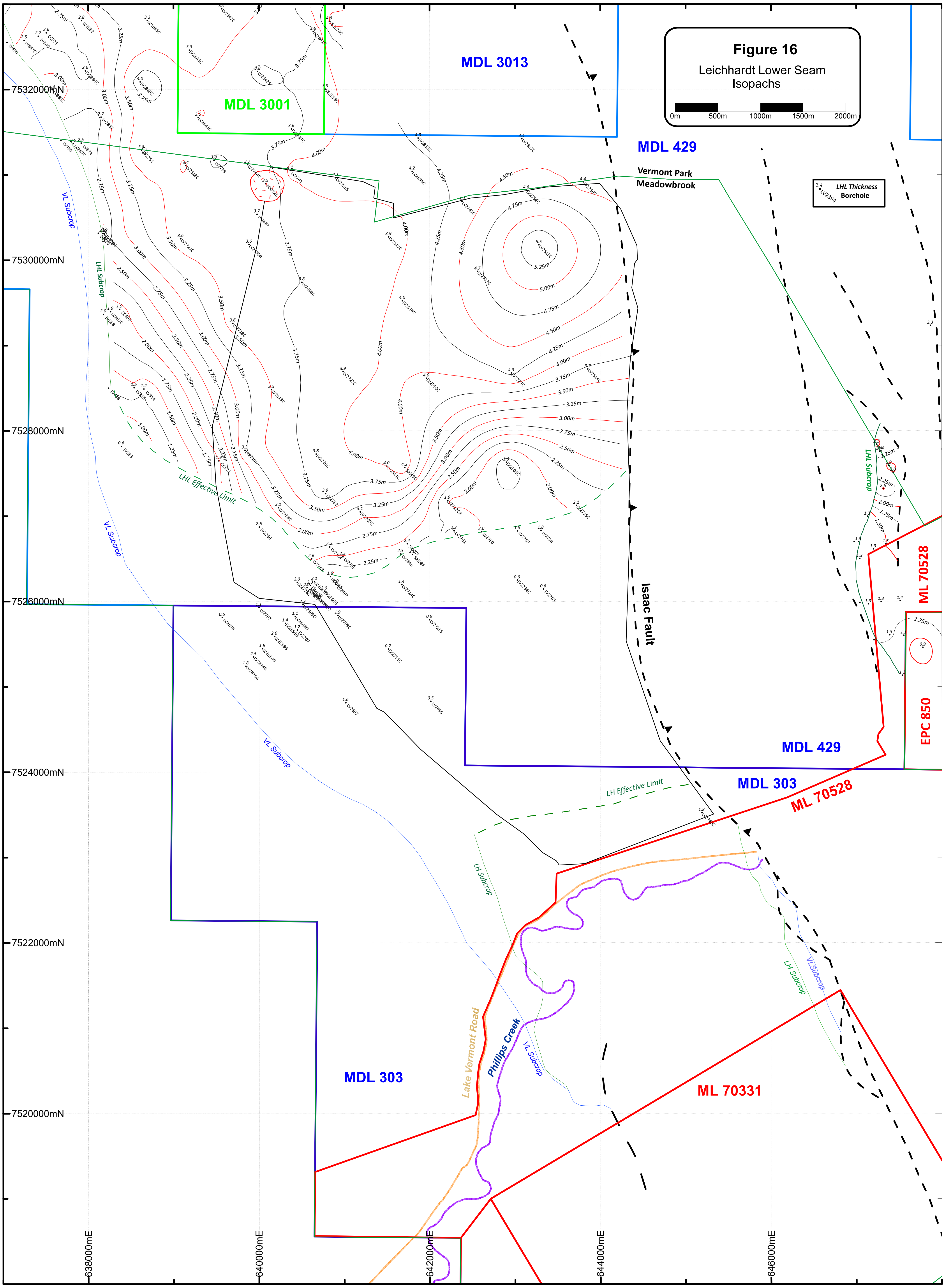


Figure 16

Leichhardt Lower Seam Isopachs

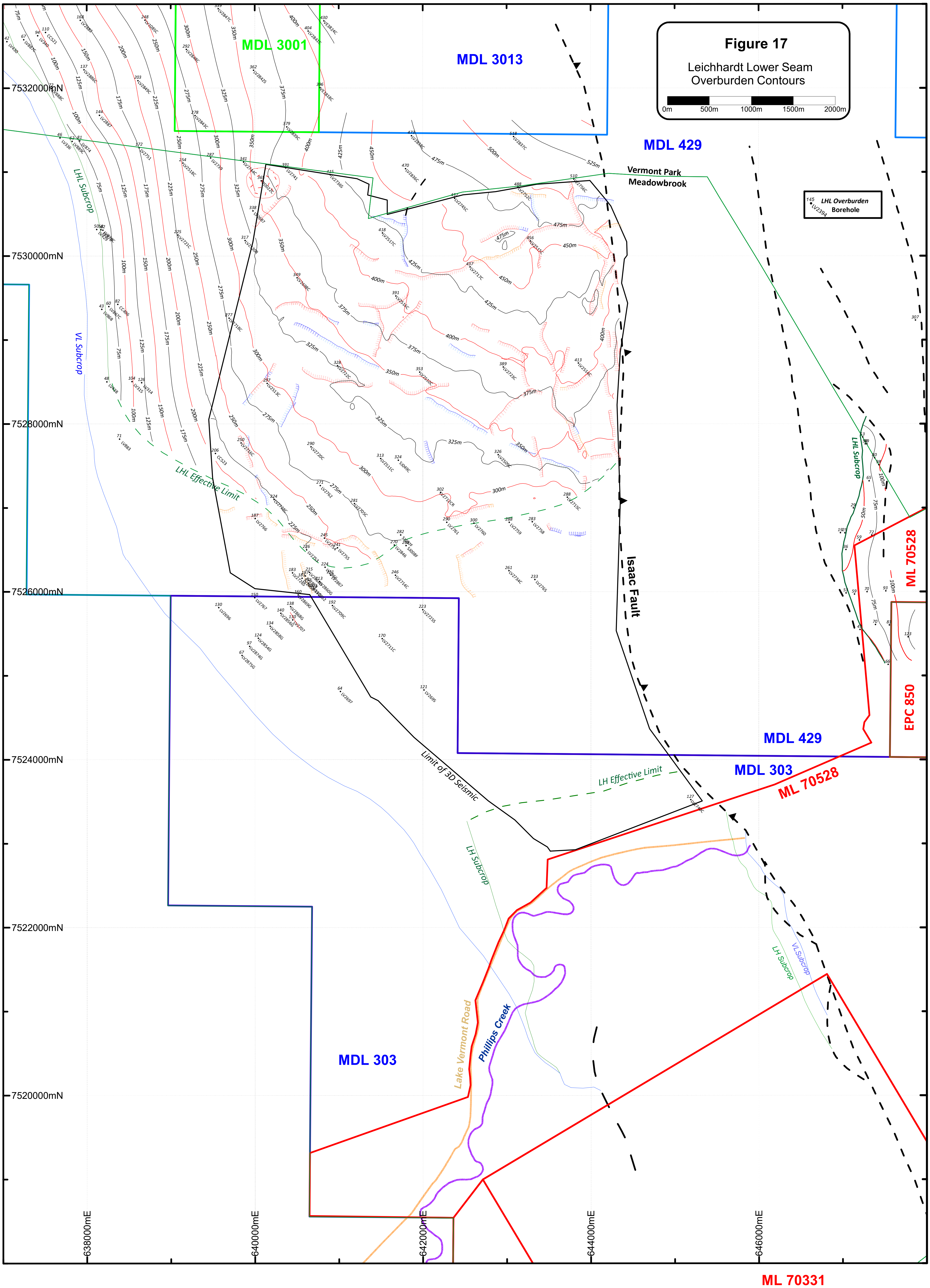


Figure 17
Leichhardt Lower Seam
Overburden Contours
0m
500m
1000m
1500m
2000m
LHL Overburden
Borehole
MDL 3001
MDL 3013
MDL 429
MDL 429
MDL 303
MDL 303
ML 70528
ML 70528
EPC 850
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
Limit of 3D Seismic
LHL Effective Limit
LH Effective Limit
LHL Subcrop
LHL Subcrop
VL Subcrop
LH Subcrop
LH Subcrop
VLSubcrop
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

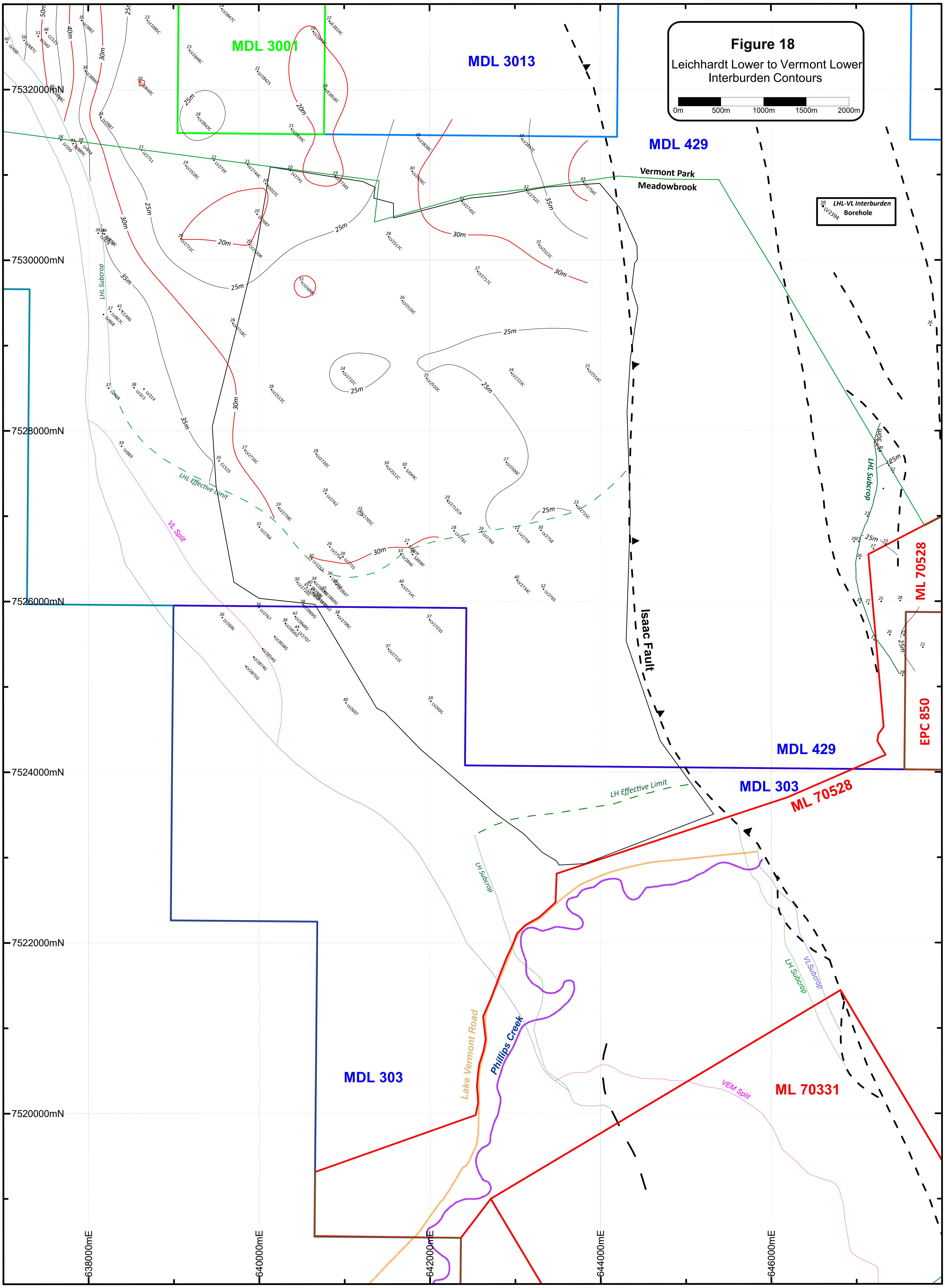


Figure 18
Leichhardt Lower to Vermont Lower Interburden Contours
0m
500m
1000m
1500m
2000m
LHL-VL Interburden Borehole
MDL 3001
MDL 3013
MDL 429
Vermont Park
Meadowbrook
MDL 303
ML 70528
EPC 850
ML 70331
Isaac Fault
LHL Subcrop
LHL Effective Limit
VL Split
LH Effective Limit
LH Subcrop
VLSubcrop
VEM Split
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

6.2.3 Vermont Lower Seam

The VL is the main seam of commercial significance throughout Meadobrook and has been intersected at depths ranging from 27m (weathered) to 557m (Figure 10). The faults shown on the plan within the 3D seismic area are from the interpretation of the 3D seismic but are limited to faults with throws consistently greater than seam thickness.

Within the MDL 303 part of Meadowbrook the VL maintains a consistent thickness of 3.5m to 4.5m until it splits in the north-western corner of the MDL into two, thin, higher ash seams, the Vermont Lower 1 seam (VL1) and the Vermont Lower 2 seam (VL2). In MDL 429 east of approximately 640,000mE the VL is 3m to 5m thick; but thins to between 2m and 3m in a north-south trending zone between approximately 638,000mE and 640,000mE (Figure 19). There is a significant deterioration in coal quality as the seam thins.

The area of split VL extends from MDL 303 into MDL 429 adjacent to the western crop line (Figure 19). VL1 is 0.9m to 2m thick (Figure 20). The VL1 to VL2 parting attains a maximum thickness of 1.1m in LV2694 (Figure 21). The VL2 is 2.4m to 2.7m thick in MDL 303 but thins to between 1.2m and 1.5m in MDL 429 (Figure 22).

The Vermont Rider seam (VR) is present above the VL in holes along the VL cropline north of 7,530,000mN in Meadowbrook. It was also coded in a handful of downdip holes in Meadowbrook in no defined pattern. The VR is typically 0.3m to 0.8m thick (average 0.5m) and is separated from the underlying VL by 0.2m to 2m (average 0.7m) of carbonaceous mudstone and/or siltstone.

The VL is also the main seam of economic interest in the Central Block of Meadowbrook where it comprises 4m to 5m of clean coal (Figure 19).

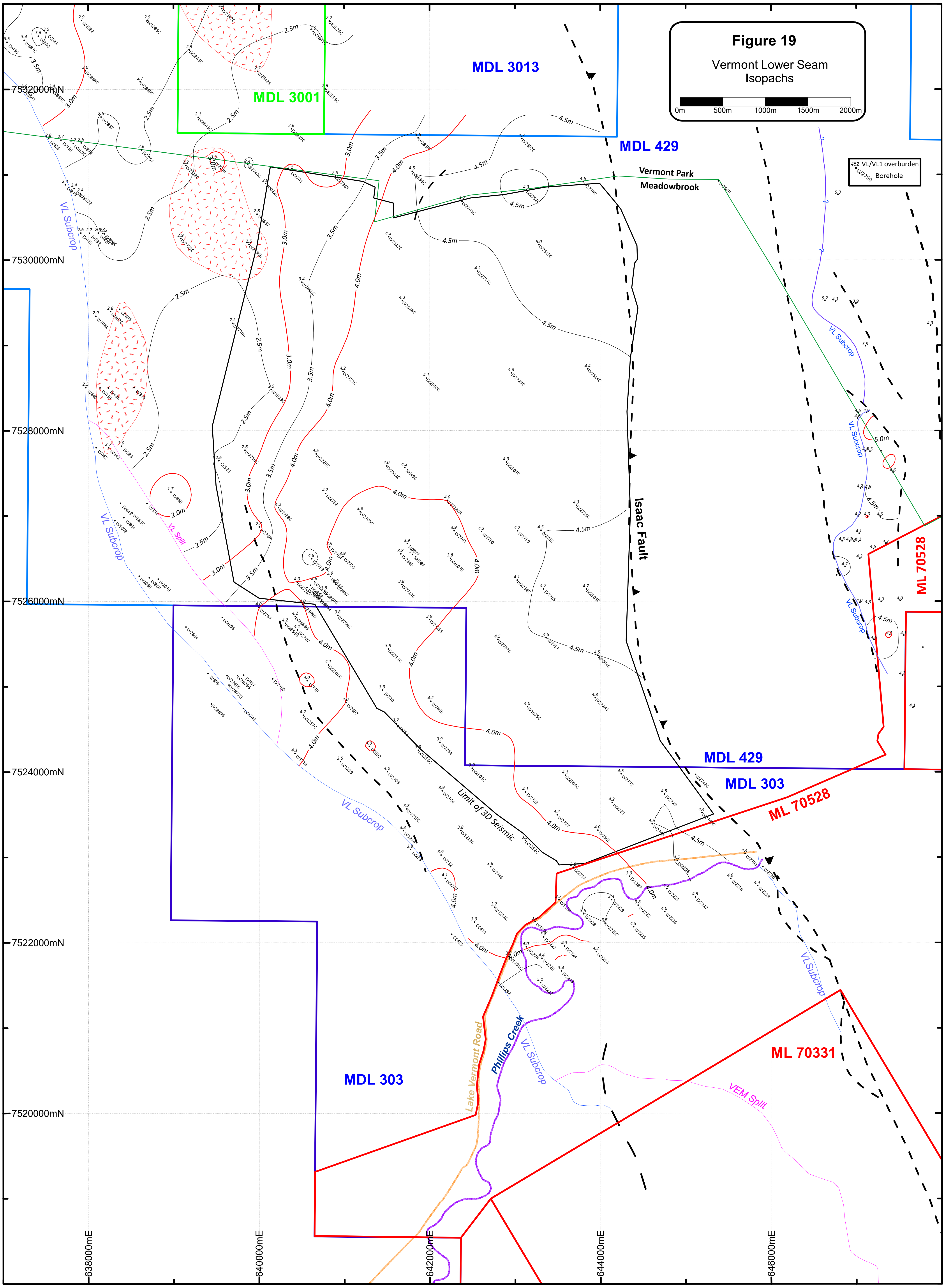


Figure 19
Vermont Lower Seam Isopachs
0m
500m
1000m
1500m
2000m
VL/VL1 overburden
Borehole
MDL 3013
MDL 3001
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
Limit of 3D Seismic
VL Subcrop
VL Split
VEM Split
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

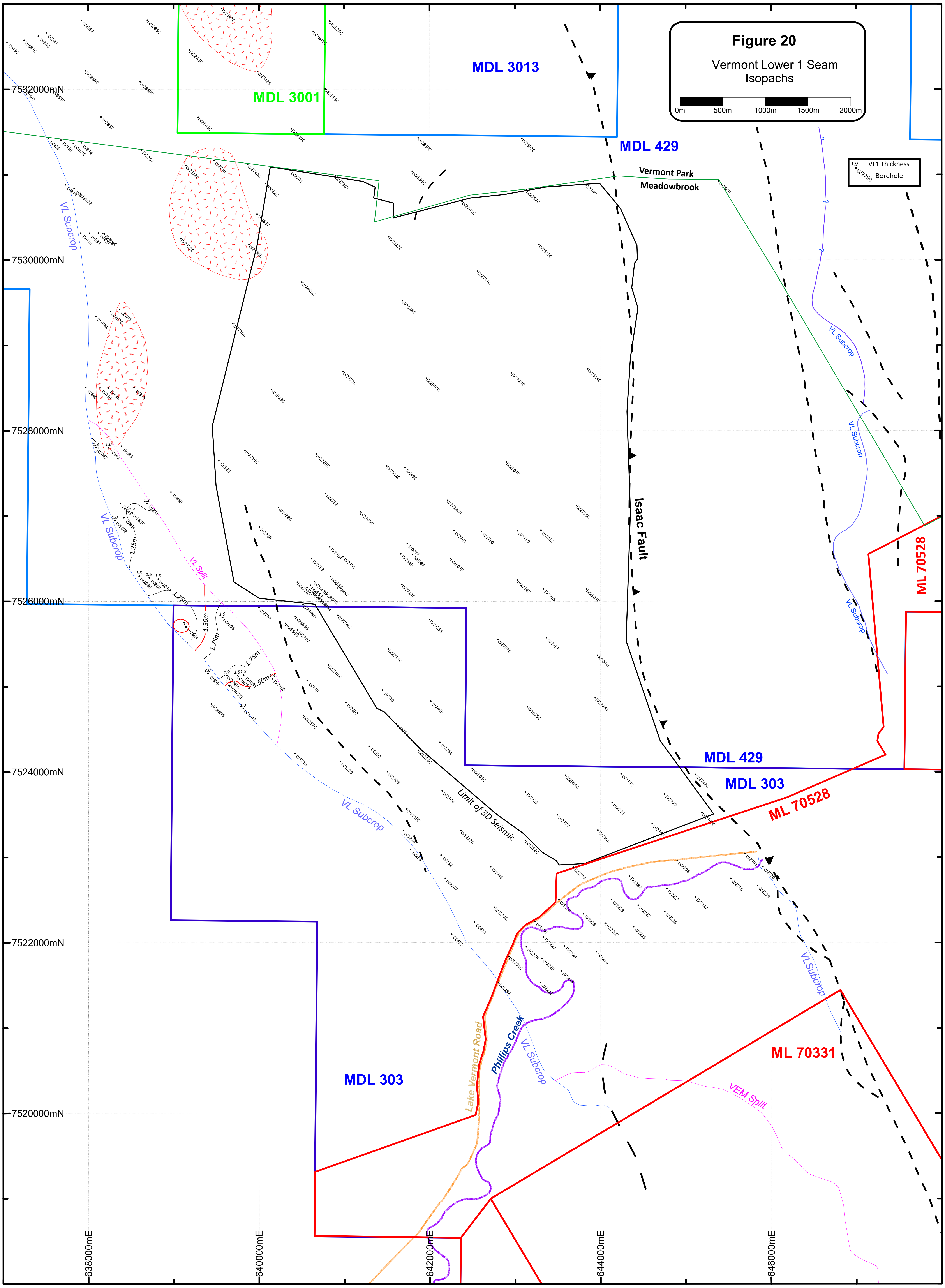


Figure 20
Vermont Lower 1 Seam
Isopachs
0m
500m
1000m
1500m
2000m
VL1 Thickness
Borehole
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
MDL 429
MDL 303
ML 70528
ML 70528
ML 70331
MDL 303
Isaac Fault
Limit of 3D Seismic
VL Subcrop
VL Subcrop
VL Subcrop
VL Subcrop
VL Subcrop
VL Subcrop
VLSubcrop
VL Split
VEM Split
Lake Vermont Road
Phillips Creek
1.25m
1.25m
1.50m
1.75m
1.75m
1.50m
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

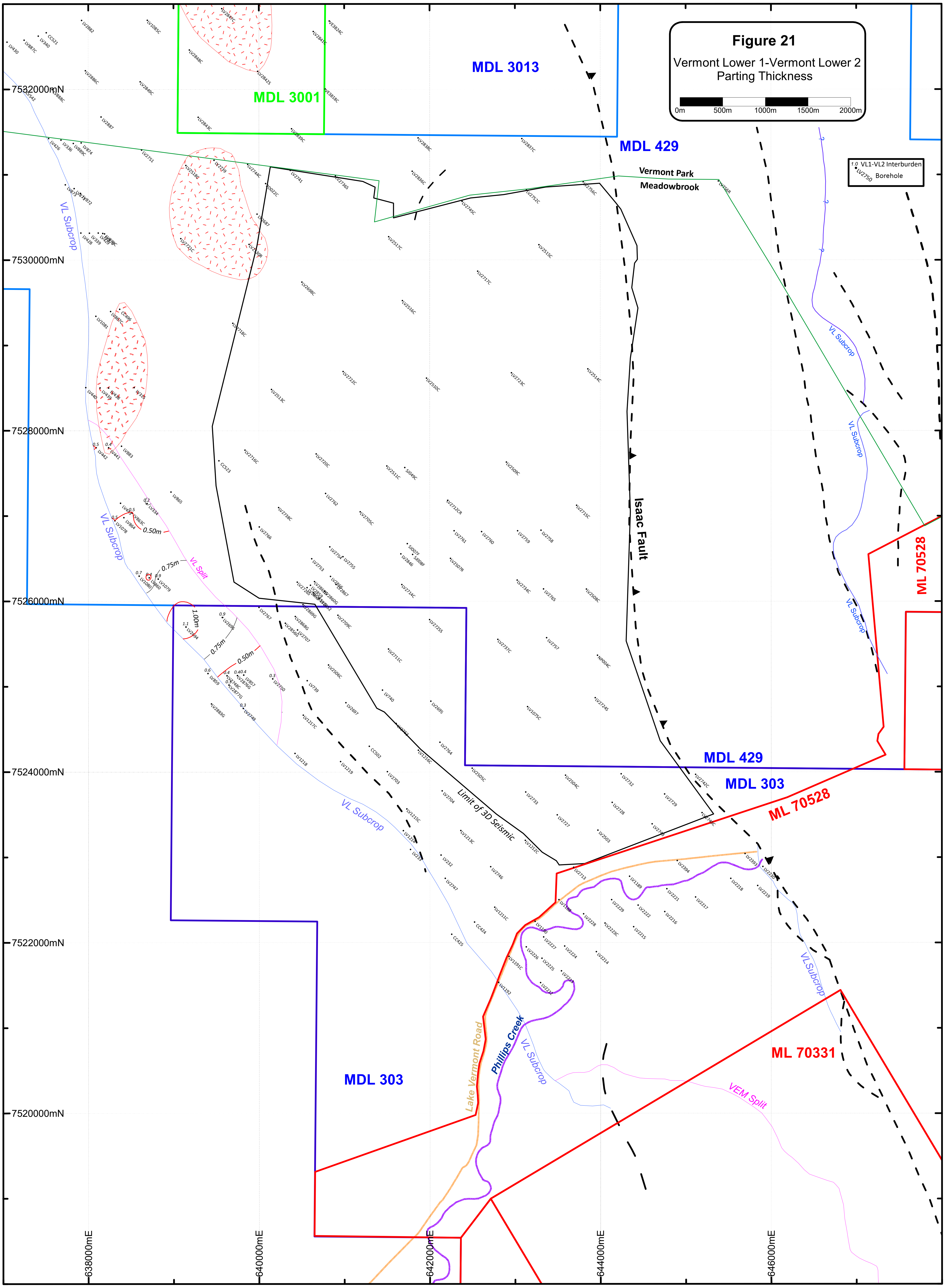


Figure 21
Vermont Lower 1-Vermont Lower 2
Parting Thickness
0m
500m
1000m
1500m
2000m
1.0 VL1-VL2 Interburden
Borehole
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
Isaac Fault
VL Subcrop
VL Split
VEM Split
Limit of 3D Seismic
MDL 429
MDL 303
ML 70528
ML 70331
MDL 303
Lake Vermont Road
Phillips Creek
0.50m
0.75m
1.00m
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

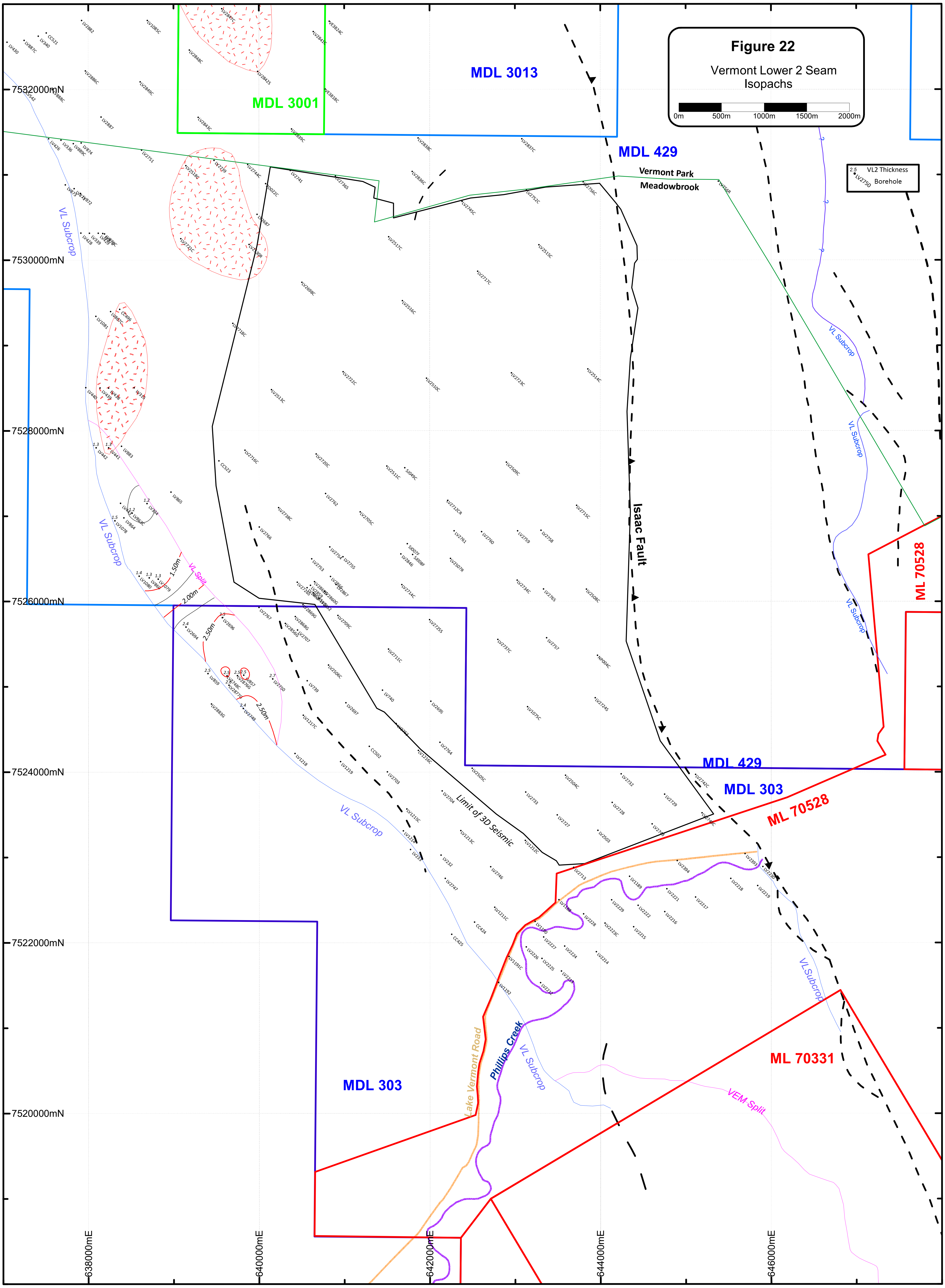


Figure 22
Vermont Lower 2 Seam Isopachs
0m
500m
1000m
1500m
2000m
VL2 Thickness
Borehole
MDL 3001
MDL 3013
MDL 429
Vermont Park
Meadowbrook
MDL 303
ML 70528
ML 70331
Isaac Fault
Limit of 3D Seismic
VL Subcrop
VL Split
VEM Split
Lake Vermont Road
Phillips Creek
1.50m
2.00m
2.50m
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

6.2.4 Girrah Seam and Girrah Upper Seam

The uppermost seam in the Fort Cooper Coal Measures in the Western Block of Meadowbrook is the Girrah Seam. At the northern end of Meadowbrook, the VL to Girrah seam interburden is 75m to 80m and the Girrah seam is 24m to 27m thick. To the south, along the MDL 429/MDL 303 boundary, the VL/Girrah interburden is 60m to 64m and the seam is 24m to 26m thick.

The Girrah seam is a typical FCCM seam and has no current commercial potential. The raw ash of Girrah seam samples taken from LV2725S for gas testing ranged from 25% to 70%; and the calculated raw ash of the full 24m thick "seam" was 53%. There was only one ply less than 30% raw ash. The ply, 7m below the top of the seam, was 2.1m thick, with a raw ash of 29%.

The uppermost seam in the Fort Cooper Coal Measures in the Central Block of Meadowbrook 1.5m to 2m thick Girrah Upper Seam (GU), which is typically located 25m to 30m below the VL.

The first thick coaly horizon is the 15m to 20m thick Girrah Seam, which is located 35m to 40m below the GU in Meadowbrook. The GU and the Girrah seam are typical, heavily stone-banded, high inherent ash, Fort Cooper Coal Measures seams and have no current commercial potential.

6.3 LOCAL STRUCTURE

The Isaac Fault, which passes approximately north to south through Meadowbrook separates relatively undisturbed sediments of the Western Block from a complex zone of folded and faulted sediments to the east. Potentially economic coal resources in Meadowbrook occur to the west of the Isaac Fault within a slightly asymmetric, north-northwest trending, north plunging, drag synclinal structure (Figure 23), which closes to the south in ML 70331 against the Isaac Fault (Figure 5). A small area of potential open cut resources is present in the Central Block adjacent to the eastern boundary of Meadowbrook.

The structure in in the Western Block is dominated by the Isaac Fault, which is responsible for a drag syncline at the southern end of the area that produces a second, eastern crop of the LH and VL seams in ML 70528. In MDL 303 The syncline plunges gently to the north as demonstrated by the closure of the -25m to -100m structure contours in Figure 23.

In MDL 303 and MDL 429 the VL dips northeast to east at 5^{o} to 10^{o} near the crop and flattens out at depth before trending upwards again on the footwall of the Isaac Fault (Figure 23). Cross-sections through the Western Block are included in Figure 6.

Outside the 3D seismic area, a northwest trending, east side up reverse fault with a throw of approximately 20m was interpreted from drilling in the 2017 resource statement between holes LV1214 and LV1215 near the crop of the VL in MDL 303 (Figure 23). This fault has now been extended into the 3D seismic area.

Apart from the structures greater than seam thickness interpreted from the 3D seismic and the fault identified in the 2017 resource statement, a fault along the northern boundary of the 3D seismic area has been extended to the north due to a large deflection in the structure contours.

The Rangal Coal Measures in the Central Block of Meadowbrook strike generally N-S and dip east from 6° in the south to 12° in the north. The structure, stratigraphy and quality are not defined to an adequate degree of certainty north of 7,528,200mN to define resources; and in any case, potential resources in this area fall outside Meadowbrook property. Over 1.7km of strike length north of 7,525,000mN the Rangal Coal Measures subcrop to the west against the reverse fault that separates the Central Block from the Isaac Block. In this location the fault has a throw of approximately 150m. Resources are limited to the north, near the eastern boundary of Meadowbrook by an east side down normal fault, one of two interpreted NW-SE trending, en-echelon normal faults that cut the Rangal Coal Measures in the area. The strike of the southern fault swings N-S south of 7,528,000mN. Structure contours to the base of the VL are shown in Figure 23.

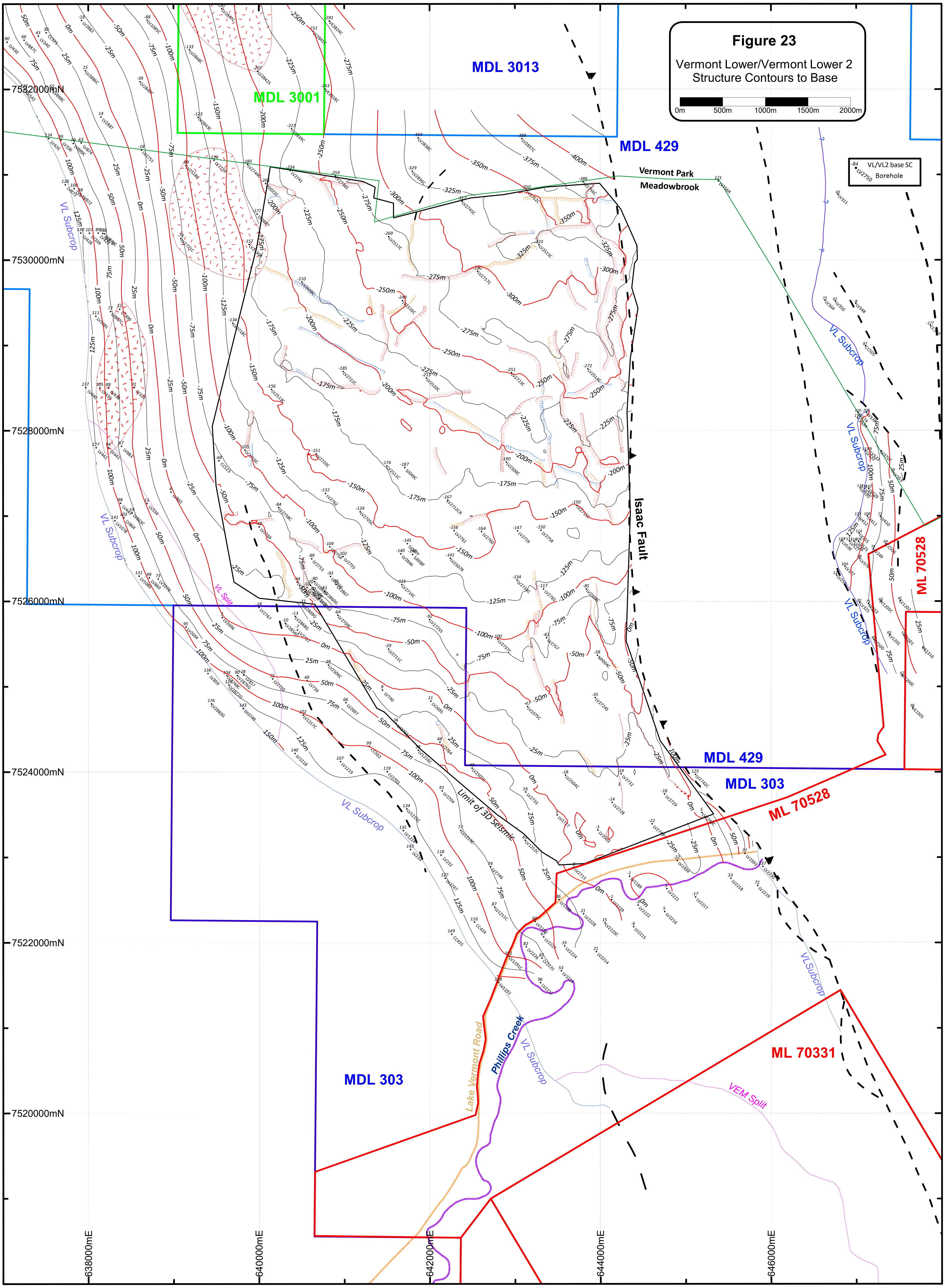


Figure 23
Vermont Lower/Vermont Lower 2
Structure Contours to Base
0m
500m
1000m
1500m
2000m
VL/VL2 base SC
Borehole
MDL 3013
MDL 3001
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
Limit of 3D Seismic
VL Subcrop
VL Split
VEM Split
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

6.3.1 3D Seismic

The main features in the 3D seismic area are north to north-northwest trending faults sub-parallel to the Isaac Fault that tend to increase in throw and intensity approaching the Isaac Fault. Within 1km of the Isaac Fault the throws are typically 10m to 40m. As the intensity of faulting decreases away from the Isaac Fault significant areas of ground between the major faults are available for underground mining.

An independent interpretation of the 3D seismic undertaken by Garry Fallon of Geophysical Resources and Services Pty Ltd:

- Confirmed the major, large displacement structures
- Concluded that the minor structures could be
  - Small displacement faults (< seam thickness); or
  - Seam rolls; or
  - Changes in roof or floor characteristics with no displacement
- Highlighted
  - Decreasing certainty and accuracy with decreasing depth; and
  - That the Velseis interpretation was conservative, especially in the deeper northern area, where there is a possible overestimation of fault throws in the order of 20% to 30%.
- Recommended data reprocessing and additional analysis to assist detailed operational planning.

6.4 INTRUSIVES AND COKING

The PH1 seam and the LHL were coked in Arrow hole PD022C in MDL 429, at the northern end of Meadowbrook in the Western Block (Figure 17). A 32m thick intrusive sill was intersected near the base of the Rewan Group, with the base of the intrusive only 8m above the PH1. Another 10m of intrusive was intersected in the LHL/VL interburden; and another 17m of intrusive material was intersected below the VL. However, the VL in the hole was not heat affected. The LHL has not been coked or intruded in any of the holes adjacent to PD022C.

The VL has been partly coked/and or heat affected in (Figure 23): four holes to the west of PD022C; and five holes close to the subcrop of the VL in Meadowbrook.

To date no holes have been drilled between the VL heat affected zone west of PD022C and the coked zone adjacent to the VL subcrop; and there is a possibility that heating and/or coking is more extensive than currently shown.

There is no evidence of heat affected coal or coking in the Central Block.

7 COAL TESTING AND QUALITY

Samples of the LH, LHL, VL and any splits of the seams have been taken for testing and analysis from holes in and adjacent to the Western Block and the Central Block.

Coal samples taken from holes up to LV553C were 63mm diameter (HMLC) and provided only a limited mass of coal (approximately 4kg/m) for testing and analysis. Subsequently, 100mm diameter conventional cores (10 to 11kg/m) were taken from shallower sites (originally <200m but increased to <300m); and 61mm diameter cores (4kg/m) from deeper sites using HQ diamond wireline drilling techniques.

7.1 ANALYTICAL PROCEDURES

Up until 2003, when it was recognised that coal from Lake Vermont could produce a primary coking product, most coal samples were analysed on the basis that the coal would be mined and sold raw into the export thermal coal market. Ply by ply samples were tested for relative density (RD), ash, total sulphur (S) and Crucible Swelling Number (CSN). The seam composite, prepared from the plies, was analysed for RD, Proximate Analysis (PA), S, CSN, chlorine (Cl), phosphorus (P), Specific Energy (SE) and ash constituents.

From 2005 all samples underwent some form of washability and clean coal analysis, even if in an abbreviated form. Samples were initially treated as follows:

- Weigh, air dry and reweigh
- Drop each sample 10 times, crush or hand knapp oversize to pass 31.5mm and drop a further 5 times
- Divide out sub-samples for raw coal analysis and, if required fresh floats analysis and washability testing; and
- Crush raw coal sub-sample to -4mm and analyse for: RD, PA, S, P, Cl, and CSN.

The fresh floats sub-samples were tested as 31.5mm x 0mm prior to 2010, or 31.5mm x 16mm and 16mm x 0mm subsequently. The samples were float/sunk at RD 1.375 and the F1.375 and analysed for: PA, S, P, ash analysis, CSN, fluidity, dilatation; and, for the 2010 samples only, GKCT. The main purpose of the fresh floats testing was to determine the suitability of the coal samples as a coking coal, to obtain the optimum plastic properties (the aim was to test the fresh floats samples within a month of the drill date); and to define working sections; especially for the underground areas.

Sub-samples from most of these holes also underwent full pre-treatment, including:

- Dry tumbling and wet tumbling
- Division into four size fractions (31.5mm x 16mm, 16mm x 1.4mm, 1.4mm x 0.25mm and 0.25mm x 0mm)

- Detailed float/sink analysis of the top three size fractions; and modified tree flotation or Jameson Cell testing of the 0.25mm x 0mm size fraction
- Preparation of clean coal composites, quality permitting, for a primary coking coal product, a secondary PCI product and for the 2020/2021 program, a tertiary energy coal product; and
- 7kg coke oven testing of high yield coking composites, either from a single hole for 100mm cores or between two and four holes for 61mm cores.

7.2 RAW COAL QUALITY

Raw coal quality is presented on an air-dried basis. The laboratory RD for holes from the Western Block proved unreliable in several samples, especially those from the 2006 exploration in MDL 429, where the laboratory RD is much lower than would be expected from the raw ash; and from holes in the coked/heat affected zones, where the laboratory RD is much higher than would be expected from the raw ash. Therefore, the RD used for the conversion to in-situ RD by the application of the Preston-Sanders formula was calculated using the following RD-ash regression equations:

- RD (ad) = 1/(0.7690-0.00455*ash% ad) – for LH
- RD (ad) = 0.01*ash% ad +1.2775 - for LHL
- RD (ad) = 0.0093*ash% ad + 1.2833– for VL

The regression equation for the LH is the one used in 2017 and based on more than 200 holes from the Lake Vermont Project area. The equation for the LHL is based on holes from the Western Block of MDL 429. The equation for the VL is based on 109 holes from MDL 303, and MDL 429, as well as holes from the northern end of ML 70528. The RD calculated from the regression equation was converted to in-situ RD using the Preston-Sanders formula and an in-situ moisture of 5%.

The laboratory RD is still recorded in the raw quality tables for comparison purposes. Anomalous RDs (>0.03 difference between the laboratory RD and the calculated RD) are highlighted in bolded red.

7.2.1 Leichhardt Seam

The LH in the Western Block is more than 2m thick along the southern boundary of MDL 303 and thins to the west and north (Figure 14). The LH is not considered economic north of LV1212C and LV2503C. Based on the geophysical profile it was not even cored in LV2740C or the core holes adjacent to LV2732, LV2733 and LV2743. The only samples of the LH taken during the 2020/2021 program were from the core hole adjacent to LV2746 close to the western cropline of the LH (Figure 24).

Raw coal quality data for the LH on an air-dried basis are presented in Table 2. The raw ash yield (Figure 24) is lowest (<22%) in the southwest corner of MDL 303 and increases northwards to more than 29% in LV1212C.

The in-situ RD (RD PS), as expected since the data were calculated from the RD/ash regression, is also lowest (1.46) in the southwest corner of MDL 303 and increases northwards to more than 1.54 in LV1212C (Figure 25).

Table 2 — Leichhardt Seam Raw Coal Quality – Western Block

Hole	**East**	**North**	**LH**		**Raw Quality % (adb)**							
			from	**thick**	**RD lab**	**RD calc**	**RD PS**	**IM**	**Ash**	**VM**	**S**	**P**
LV199	643300	7520799	42.0	2.9	1.42	1.42	1.40	1.6	14.2	20.4	0.36	0.149
LV200	643453	7520882	57.3	3.0	1.45	1.45	1.43	1.5	17.8	19.3	0.34	0.264
LV1188C	643513	7522501	92.6	2.8	1.56	1.54	1.51	1.9	26.2	20.4	1.53	0.032
LV1189C	644359	7522695	132.6	2.4	1.53	1.52	1.49	1.8	24.1	20.3	0.32	0.210
LV1195C	643951	7521535	135.0	3.1	1.45	1.44	1.42	1.9	15.9	20.0	0.99	0.110
LV1196C	644680	7521739	123.0	2.5	1.49	1.47	1.45	2.1	19.2	20.4	0.31	0.086
LV2201C	646101	7522336	50.0	2.2	1.48	1.47	1.44	1.5	19.4	19.4	0.71	0.167
LV2213C	643541	7521669	89.9	2.4	1.43	1.43	1.41	1.2	15.6	20.9	0.84	0.082
LV2223C	644051	7522227	117.4	2.0	1.47	1.47	1.44	1.5	19.2	20.7	0.29	0.196
LV2393C	645693	7523041	37.9	3.0	1.51	1.51	1.48	1.5	23.2	18.4	0.80	0.107
LV2394C	644899	7522959	144.3	2.2	1.54	1.51	1.48	1.0	23.9	21.0	0.35	0.104
LV2395C	645287	7522117	139.4	2.4	1.48	1.46	1.44	1.3	18.9	21.0	0.37	0.088
LV1212C	643118	7523199	74.2	1.8	1.57	1.57	1.54	1.7	29.4	19.7	1.23	0.254
LV2503C	643967	7523322	123.5	2.0	1.53	1.53	1.50	1.9	25.1	20.2	0.34	0.208
LV2746C	642714	7522894	43.73	1.8	1.54	1.52	1.49	1.5	24.2	19.3	0.45	
Max				**1.8**	**1.42**	**1.42**	**1.40**	**1.0**	**14.2**	**18.4**	**0.29**	**0.032**
Min				**3.1**	**1.57**	**1.57**	**1.54**	**2.1**	**29.4**	**21.0**	**1.53**	**0.264**
Ave				**2.4**	**1.50**	**1.49**	**1.46**	**1.6**	**21.1**	**20.1**	**0.62**	**0.147**
RD calc	1/(0.7690-0.00455*ash% ad)											
RD PS	RD calc*(100-IM)/(100+(RD calc*(5-IM))-5)											

Raw volatile matter (VM) of the LH in MDL 303 is highest in the centre of the area (20% to 20.5%) and decreases to less than 20% to the east and west (Table 2, Figure 26).

Raw sulphur (S) in MDL 303 varies from low (0.3%) to high (1.5%) but is distributed in a regular fashion (Figure 27). There is a wide zone of low S (<0.4%) through the centre of the area east of a north-south trending zone of high S (1% to 1.5%). Adjacent to the eastern crop, S increases to between 0.5% and 0.8%.

Raw phosphorus (P) varies from low (0.03%) to very high (0.25%), but most of the area falls in the high range (0.1% to 0.2%). There is a zone of high to very high P in the northwest (Figure 28); and a zone of relatively low (<0.1%) raw P in the south-western corner of MDL 303.

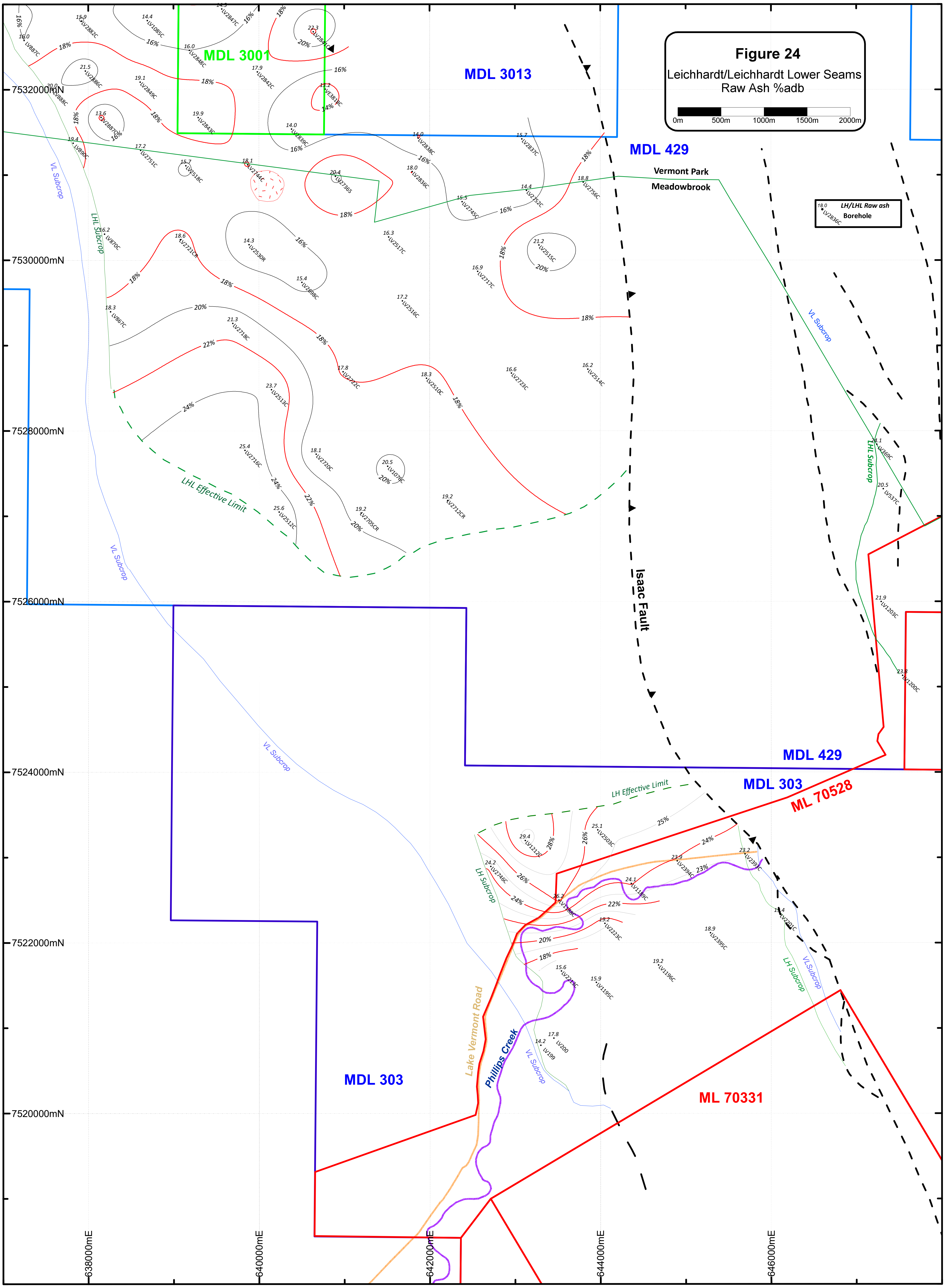


Figure 24
Leichhardt/Leichhardt Lower Seams
Raw Ash %adb
0m
500m
1000m
1500m
2000m
LH/LHL Raw ash
Borehole
MDL 3001
MDL 3013
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
LHL Effective Limit
LH Effective Limit
LHL Subcrop
LH Subcrop
VL Subcrop
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

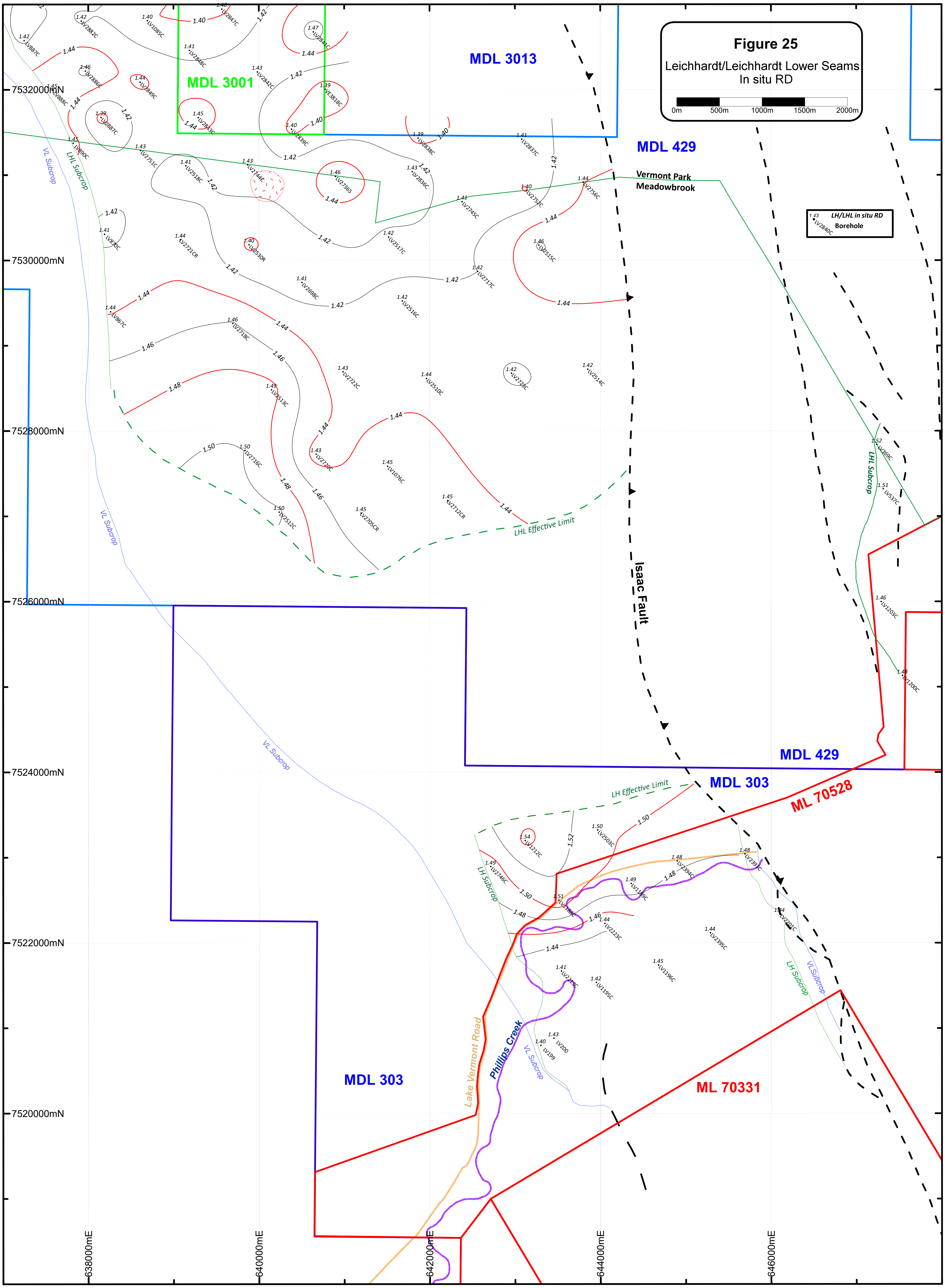


Figure 25
Leichhardt/Leichhardt Lower Seams
In situ RD
0m
500m
1000m
1500m
2000m
MDL 3001
MDL 3013
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
LH/LHL in situ RD
Borehole
Isaac Fault
LHL Effective Limit
LH Effective Limit
VL Subcrop
LHL Subcrop
LH Subcrop
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

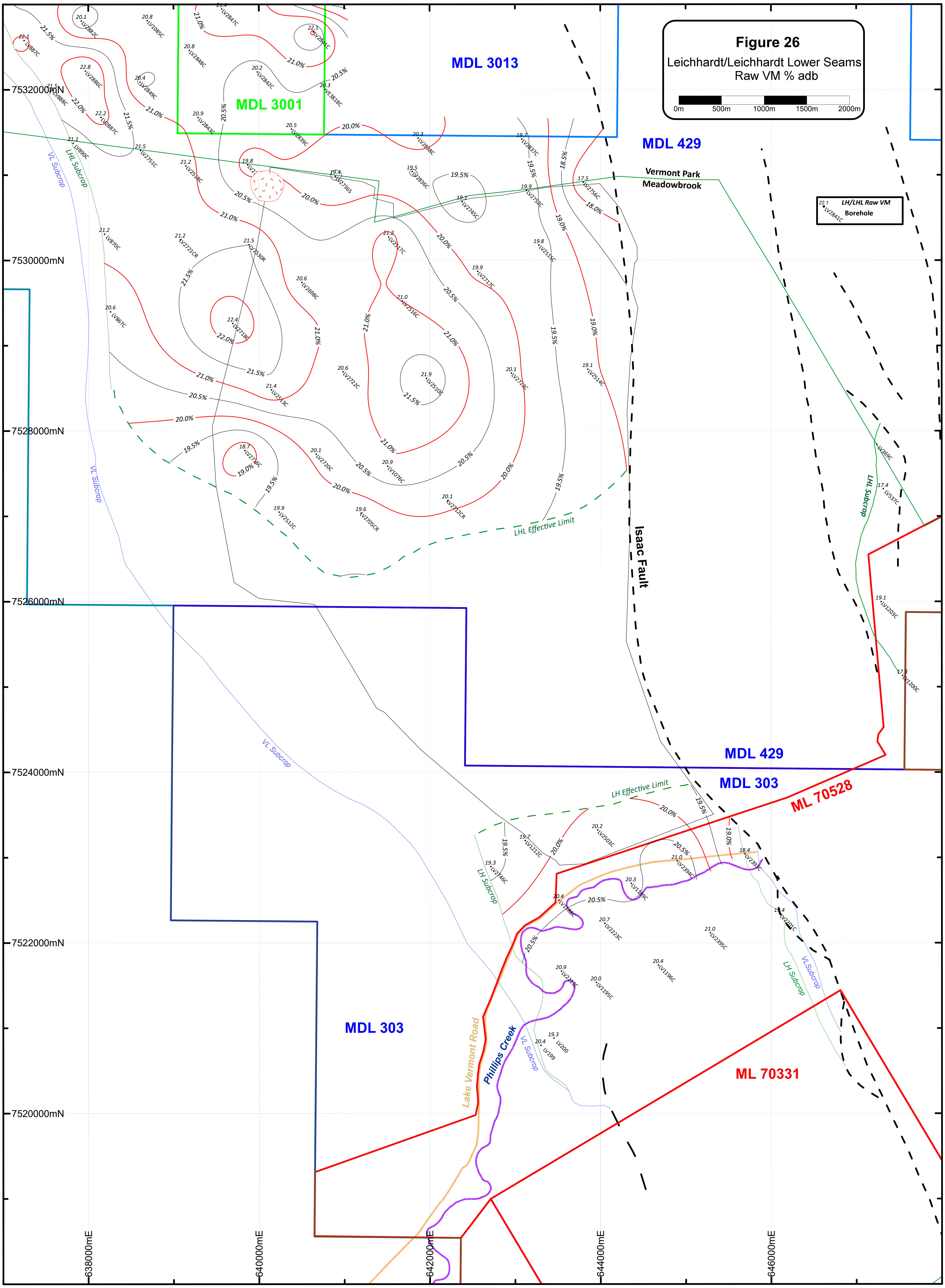


Figure 26
Leichhardt/Leichhardt Lower Seams
Raw VM % adb
0m
500m
1000m
1500m
2000m
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
LH/LHL Raw VM
Borehole
Isaac Fault
LHL Effective Limit
LH Effective Limit
MDL 303
ML 70528
ML 70331
Lake Vermont Road
Phillips Creek
VL Subcrop
LHL Subcrop
LH Subcrop
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

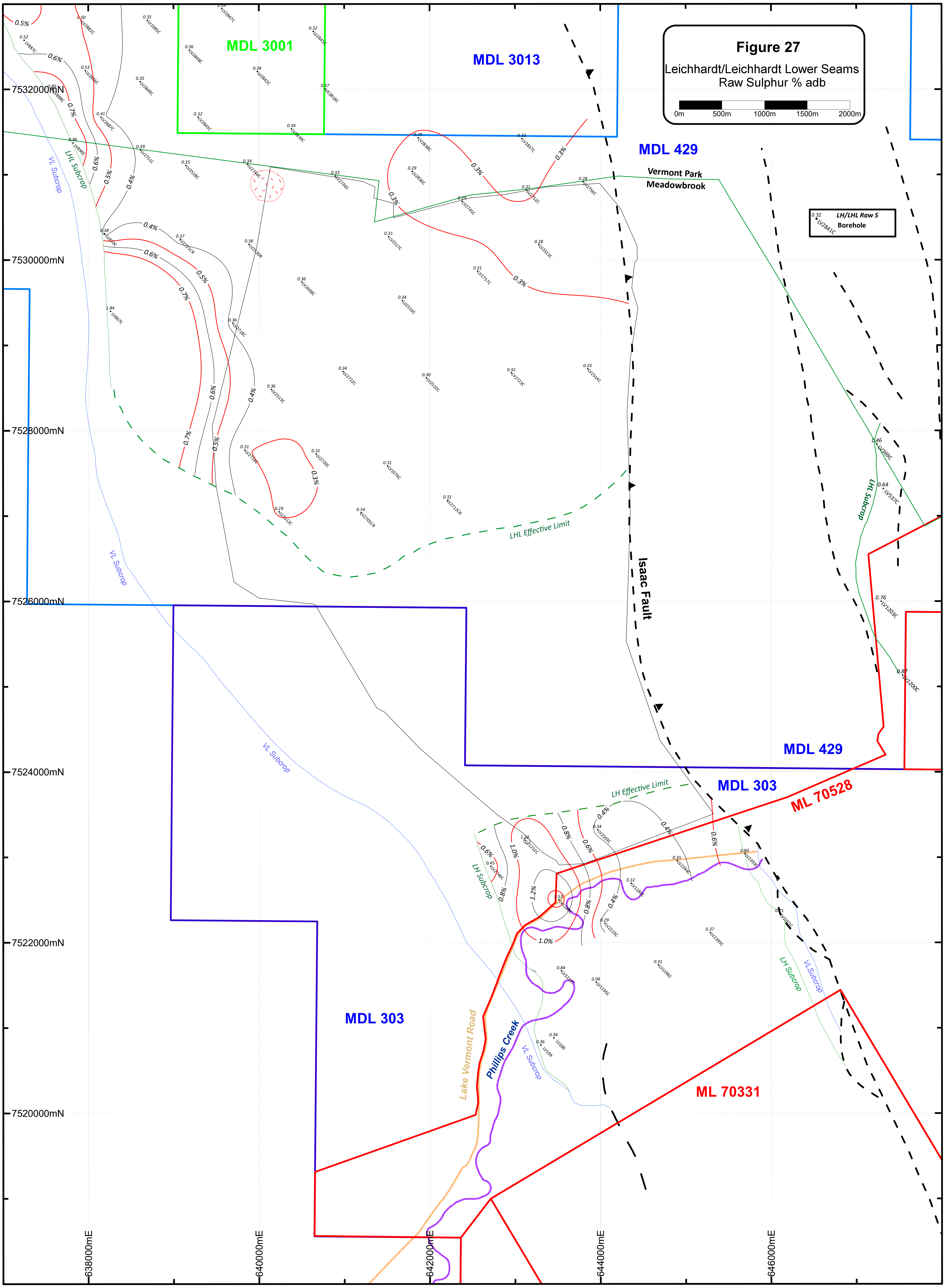


Figure 27
Leichhardt/Leichhardt Lower Seams
Raw Sulphur % adb
0m
500m
1000m
1500m
2000m
LH/LHL Raw S
Borehole
MDL 3001
MDL 3013
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
LHL Effective Limit
LH Effective Limit
LHL Subcrop
LH Subcrop
VL Subcrop
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

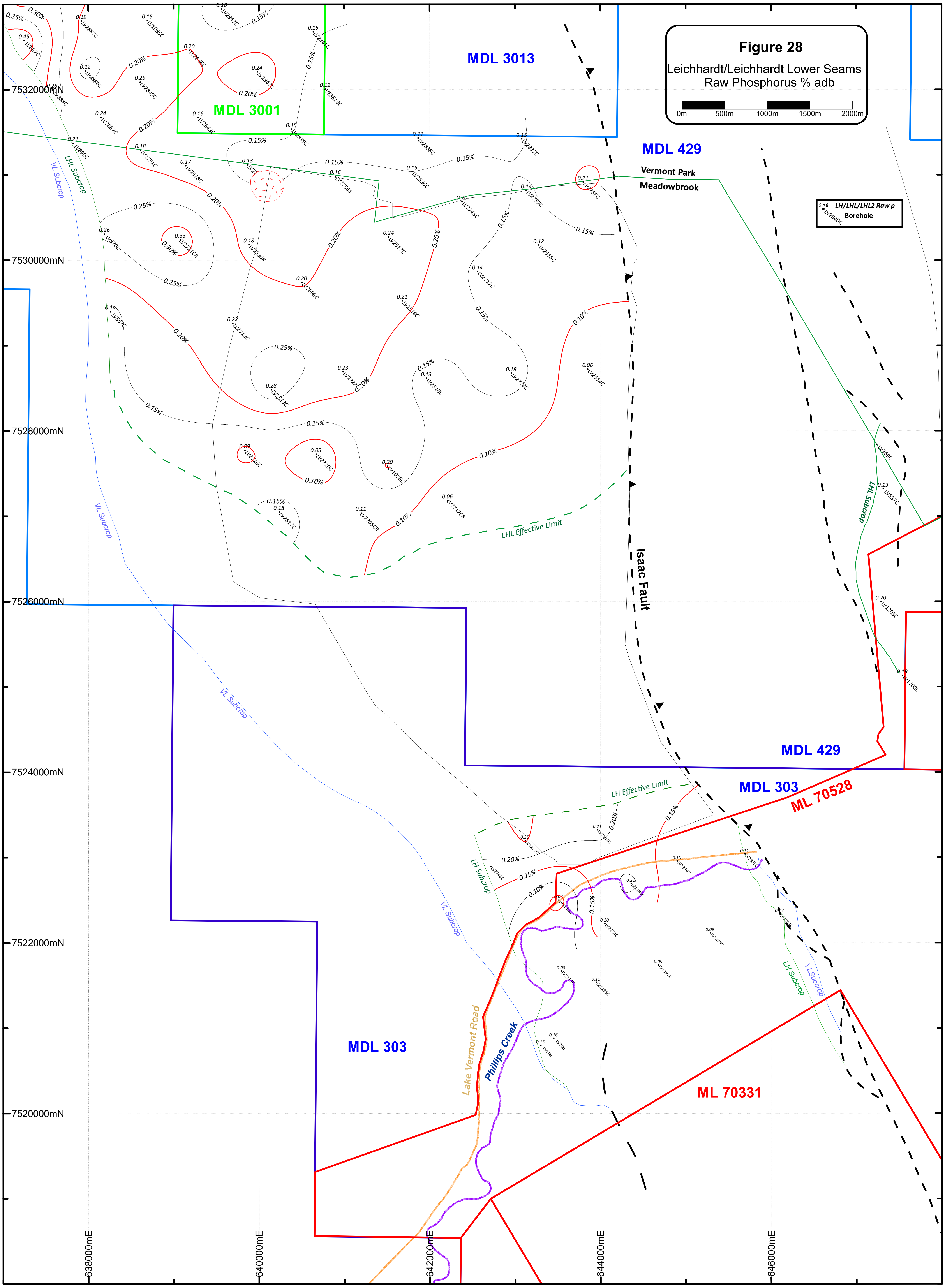


Figure 28
Leichhardt/Leichhardt Lower Seams
Raw Phosphorus % adb
0m
500m
1000m
1500m
2000m
LH/LHL/LHL2 Raw p
Borehole
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
MDL 429
MDL 303
ML 70528
MDL 303
ML 70331
Isaac Fault
LHL Effective Limit
LH Effective Limit
LHL Subcrop
VL Subcrop
LH Subcrop
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

7.2.2 Leichhardt Lower Seam

Western Block

The LHL in Meadowbrook is only present in MDL 429. As the LH thins and deteriorates from south to north in the Western Block, the LHL thins and deteriorates from north to south. Where the two seams overlap neither is of an economic thickness or quality.

Raw coal quality data for the LHL in the Western Block on an air-dried basis are presented in Table 3. The raw ash yield (Figure 24) is typically 14% to 20%. Apart from isolated holes where the raw ash exceeds 20%, there is a significant area of 20% to 26% raw ash in the southwest of the LHL area where the LHL thins and deteriorates.

The in-situ RD (RD PS) is derived from the raw ash, and the trends of the RD contours reflect trends of the raw ash contours. The in-situ RD is typically 1.39 to 1.46 (Figure 25). Apart from isolated holes where the in-situ RD exceeds 1.46, there is a significant area of 1.46 to 1.50 RD in the southwest of the LHL area where the LHL thins and deteriorates (Figure 25).

Raw volatile matter (VM) of the LHL is consistently 19.5% to 22% (Table 3, Figure 26). There is a depth related zone of lower VM down the eastern side of the 3D seismic area sub-parallel to the Isaac Fault where the VM drops from 19.5% to 17.5%; but, in general, there is little correlation between VM and depth or raw ash. The VM exceeds 22% relatively close to the LHL subcrop north of the Meadowbrook-Vermont Park boundary.

Raw sulphur (S) varies from only 0.28% to 0.36% throughout the 3D seismic area, and increases to between 0.4% and 0.8% along the crop line; but there is a significant outlier of 1.8% in LV867C (Table 10, Figure 30).

Raw phosphorus (P) varies from moderate (0.05%) to extremely high (0.45%, Table 10), but most values fall in the high range (0.10% to 0.25%). Most of the higher values are adjacent to the LHL crop line west of MDL 3001 (Figure 31). The lowest values occur in a broad zone through the south and southeast.

Table 3 – Leichhardt Lower Seam Raw Coal Quality – Western Block

Hole	**East**	**North**	**LHL/*LHL2***		**Raw Quality % (adb)**							
			from	**thick**	**RD lab**	**RD calc**	**RD PS**	**IM**	**Ash**	**VM**	**S**	**P**
LV867C	638261	7529398	60.2	1.61	1.48	1.46	1.44	1.8	18.3	20.6	1.84	0.136
LV870C	638191	7530307	62.1	2.76	1.44	1.44	1.41	1.1	16.2	21.2	0.38	0.255
LV887C	637249	7532576	67.1	2.54	**1.39**	**1.44**	1.42	1.9	16.0	22.1	0.52	0.450
LV888C	637577	7531997	72.2	3.29	**1.42**	**1.48**	1.45	1.7	20.0	21.5	0.80	0.284
LV890C	637823	7531372	61.4	2.48	**1.41**	**1.47**	1.45	1.6	19.4	21.1	0.86	0.214
LV1076C	641508	7527586	313.1	4.10	1.50	1.48	1.45	1.0	20.5	20.9	0.31	0.204
LV1085C	638694	7532809	248.3	3.34	1.43	1.42	1.40	1.4	14.4	20.8	0.35	0.151
LV2510C	641963	7528616	353.1	3.96	1.48	1.46	1.44	1.6	18.3	21.9	0.30	0.131
LV2512C	640237	7527049	217.3	2.72	1.53	1.53	1.50	1.2	25.6	19.9	0.29	0.178
LV2513C	640147	7528482	296.7	3.50	1.54	1.51	1.49	1.3	23.7	21.4	0.36	0.284
LV2514C	643853	7528723	412.7	3.70	1.44	1.44	1.42	2.2	16.2	19.1	0.33	0.058
LV2515C	643281	7530178	456.2	5.52	1.49	1.49	1.46	1.3	21.2	19.8	0.28	0.117
LV2516C	641681	7529523	390.8	4.05	1.46	1.45	1.42	1.2	17.2	21.0	0.34	0.213
LV2517C	641520	7530273	418.5	3.85	1.44	1.44	1.42	1.1	16.3	21.2	0.31	0.241
LV2518C	639144	7531108	254.1	3.45	1.43	1.43	1.41	1.2	15.7	21.2	0.35	0.174
LV2530R	639884	7530183	316.7	3.60	1.43	1.42	1.40	0.9	14.3	21.5	0.36	0.181
LV2698C	640503	7529740	348.52	3.75	1.44	1.43	1.41	1.2	15.4	20.6	0.36	0.196
LV2705CR	641196	7527037	278.15	2.92	1.46	1.47	1.45	1.4	19.2	19.6	0.34	0.107
LV2712CR	*642210*	*7527183*	*301.96*	*1.92*	*1.46*	*1.47*	*1.45*	*1.6*	*19.2*	*20.1*	*0.31*	*0.057*
LV2716C	639835	7527772	249.87	3.28	1.51	1.53	1.50	1.1	25.4	18.7	0.31	0.091
LV2717C	642563	7529869	436.63	4.69	1.44	1.45	1.42	0.9	16.9	19.9	0.31	0.137
LV2718C	639693	7529259	277.11	3.62	1.50	1.49	1.46	0.9	21.3	22.4	0.36	0.221
LV2720C	640669	7527727	290.18	3.82	1.44	1.46	1.43	1.0	18.1	20.1	0.31	0.054
LV2721CR	639079	7530242	224.08	3.69	1.46	1.46	1.44	1.1	18.6	21.2	0.37	0.332
LV2722C	640985	7528692	327.85	3.90	1.46	1.46	1.43	1.0	17.8	20.6	0.34	0.232
LV2723C	642958	7528677	389.19	4.31	1.45	1.44	1.42	1.0	16.6	20.1	0.32	0.178
LV2736S	640897	7530984	414.95	4.09	1.49	1.48	1.46	1.4	20.4	19.4	0.33	0.161
LV2744C	639867	7531119	340.91	3.65	1.48	1.46	1.43	1.4	18.1	19.8	0.34	0.132
LV2745C	642381	7530686	457.16	4.11	**1.37**	**1.43**	1.41	1.4	15.5	19.1	0.29	0.200
LV2751C	638614	7531288	175.33	4.01	1.43	1.45	1.43	1.4	17.2	21.5	0.39	0.182
LV2752C	643134	7530819	487.96	4.29	1.42	1.42	1.40	1.2	14.4	19.9	0.31	0.144
LV2756C	643800	7530915	509.82	4.43	**1.52**	**1.47**	1.44	1.2	18.8	17.5	0.28	0.210
LV2836C	641796	7531039	469.68	4.17	1.47	1.46	1.43	1.4	18.0	19.5	0.29	0.150
LV2837C	643081	7531421	518.16	4.44	1.44	1.43	1.41	1.4	15.7	19.7	0.32	0.147
LV2838C	641866	7531431	473.00	4.28	1.42	1.42	1.39	1.1	14.0	20.3	0.29	0.108
LV2839C	640382	7531537	378.57	3.64	1.41	1.42	1.40	1.3	14.0	20.5	0.34	0.152
LV2841C	640637	7532678	404.03	3.65	1.51	1.50	1.47	0.9	22.3	22.1	0.32	0.153
LV2842C	639981	7532208	361.25	3.16	1.46	1.46	1.43	1.3	17.9	20.2	0.34	0.237
LV2843C	639289	7531673	277.63	3.46	1.47	1.48	1.45	0.9	19.9	20.9	0.32	0.162
LV2847C	639565	7532946	338.55	3.36	1.42	1.42	1.40	1.1	14.3	21.4	0.39	0.104
LV2848C	639185	7532461	291.50	3.30	1.44	1.44	1.41	1.1	16.0	20.8	0.36	0.202
LV2849C	638609	7532089	202.81	3.95	1.45	1.47	1.44	1.4	19.1	20.4	0.35	0.249
LV2882C	637920	7532804	165.65	2.90	1.44	1.44	1.42	2.1	15.9	20.1	0.50	0.193
LV2886C	637967	7532218	136.88	2.62	1.51	1.49	1.46	1.2	21.5	22.8	0.53	0.122
LV2887C	638150	7531674	143.61	3.61	1.39	1.41	1.39	1.4	13.6	22.2	0.41	0.237
VE3818C	640777	7532005	396.1	3.91	1.39	1.41	1.39	1.5	13.2	20.3	0.37	0.115
Max				**1.92**	**1.37**	**1.41**	**1.39**	**0.9**	**13.2**	**17.5**	**0.28**	**0.054**
Min				**4.10**	**1.54**	**1.53**	**1.50**	**2.2**	**25.6**	**22.8**	**0.53**	**0.332**
Ave				**3.52**	**1.46**	**1.46**	**1.43**	**1.3**	**17.8**	**20.5**	**0.34**	**0.168**
RD calc	0.01 ash% +1.2775											
RD PS	RD calc*(100-IM)/(100+(RD calc*(5-IM))-5)											
1.52	Anomalous											

Central Block

Raw coal data for the LHL in the Central Block are presented in Table 4. The data show the thinning of the seam from more than 2.5m at the northern end of the resource block in MDL 429 to only 1.2m at the southern end. Despite the decrease in thickness the ash yield is consistently in the range of 21% to 24%. Sulphur (S) is moderate (0.6%) to high (1.5%) and phosphorous (P) ranges from high (0.13%) to very high (0.20%). The volatile matter (VM) of the sample from LV1203C is anomalously high, as is the RD for the sample from LV537C, given the relatively low raw ash.

The raw coal CSNs of samples taken from holes drilled in 2010 are significantly higher than samples taken from older holes, which may reflect a more rapid turnaround time for testing.

Because of so few samples the RDs have not been adjusted, even though they do not display any consistency from hole to hole. The coal quality data for the Central Block is posted in Figures 24 to 28.

Table 4 - Leichhardt Lower Seam Raw Coal Quality – Central Block

Hole	East	North	From	Thick	Raw Quality % (adb)						
			m	m	RD lab	IM	Ash	VM	S	P	CSN
LV369C	647239	7527841	53.39	2.55	1.52	1.5	24.1		1.46		3.0
LV537C	647315	7527320	65.26	2.53	1.51	1.3	20.5	17.4	0.64	0.134	1.0
LV1203C	647290	7525999	70.48	1.34	1.46	2.0	21.9	19.1	0.76	0.202	5.0
LV1200C	647540	7525133	66.30	1.16	1.48	1.9	23.8	17.3	0.87	0.192	5.0
Min				**1.16**	**1.46**	**1.3**	**20.5**	**17.3**	**0.64**	**0.13**	**1.00**
Max				**2.55**	**1.52**	**2.0**	**24.1**	**19.1**	**1.46**	**0.20**	**5.00**
Ave				**1.90**	**1.49**	**1.7**	**22.6**	**17.9**	**0.93**	**0.18**	**3.50**

7.2.3 Vermont Lower Seam and Splits

Western Block

The VL is at its thickest and most consistent throughout the potential underground area (covered by 3D seismic) and displays much more variability in the areas to the west and northwest (Figure 19). Three of the holes in Table 5 (LV767, LV768 and LV2742C) were drilled to the east of the Isaac Fault. Two (LV767 and LV2742C) were drilled adjacent to the fault where the sediments were dipping steeply into the fault at 60 degrees to 70 degrees resulting in apparent seam thicknesses two to three times the true thickness.

Raw coal quality data for the VL in the Western Block are presented in Table 5, which excludes raw quality data from holes in which the seam was heat affected and/or partly coked. The raw quality data for the heat affected and/or partly coked holes are presented in Table 6 and are posted on the raw quality figures for comparison purposes; but they have not been included in the data used to generate the raw quality contours. The coked and/or heat affected coal are characterised by:

- High raw ash
- Anomalously high laboratory RDs relative to the ash
- Anomalously high raw VM relative to the ash
- Consistently low P of 0.01% to 0.02%; and
- Very low fresh floats (F1.375) yields.

The anomalous RDs and apparently contradictory VM can be explained by the presence of high concentrations of carbonates from intrusives in the coal. The carbonates increase the raw coal RD but a high proportion report to VM rather than ash during testing for proximate analysis, resulting in anomalously high VM. Because a high proportion of the mineral matter reports to VM instead of ash, the ash, although high, is lower than it would be if the sample had typical mineral constituents.

The VL seam in LV2716C fits the above criteria, but it is an isolated occurrence adjacent to two significant faults (Figure 23); and the high carbonate content is interpreted as fault related. It does produce significant bullseyes in the quality contours.

Raw ash yield within the 3D seismic area in MDL 303 ranges from 10% to 14% (Table 5, Figure 29); but the seam deteriorates slightly approaching the VL split line in the north-western corner of the MDL, and raw ash increases steadily from 14% to 22%. In MDL 429 the raw ash ranges from 12% to 16% in the 3D seismic area where the seam is greater than 3.5m thick; but increases to more than 20% to the west as the seam thins to less than 3m. There are bullseyes of high ash centred on LV870C (32% ash) close to the VL crop line, and the carbonate rich, fault affected LV2716C (25% ash).

The in-situ RD contours (Figure 30) follow same trend as the raw ash contours. The RD is less than 1.40 throughout most of the 3D seismic area but increases to between 1.44 and 1.46 along the western edge of the 3D seismic area as the seam thins from 4m to less than 3m, with bullseyes of 1.55 centred on LV870C and 1.48 centred on LV2716C.

Raw VM of the VL seam in MDL 303 is consistently 20% to 22%. In MDL 429 the raw VM is consistently 19% to 21.5% apart from the anomalously high values in the heat affected areas and the fault affected LV2716C, which, because of its isolation, has a disproportionate effect on the contours (Tables 5 and 6, Figure 31).

There are two areas with less than 19% VM: one along the Meadowbrook – Vermont Park boundary and the other close to the Isaac Fault straddling 7,529,000mN. The raw VM increases to more than 19% in the north-eastern corner of Western Block where the seam is deepest and where the VM would normally be expected to be lowest.

Table 5 – Vermont Lower Seam Raw Coal Quality – Western Block

Hole	East	North	VL		Raw Quality % (adb)							
			from	thick	RD lab	RD calc	RD-PS	IM	Ash	VM	S	P
LV767	644549	7525197	52.5	12.7	1.34	1.38	1.36	1.4	10.4	20.4	0.46	0.038
LV768	644802	7528191	48.5	4.5	1.33	1.37	1.35	1.4	9.5	20.7	0.48	0.094
LV867C	638261	7529398	100.0	2.2	1.43	1.43	1.42	2.2	16.3	20.2	0.31	0.002
LV870C	638191	7530307	99.3	2.2	1.58	1.58	1.55	1.4	32.0	21.2	0.55	0.103
LV887C	637249	7532576	125.4	3.4	1.37	1.42	1.40	1.7	15.1	21.2	0.63	0.115
LV888C	637577	7531997	124.6	3.4	1.41	1.46	1.44	1.7	19.1	20.6	0.50	0.150
LV889C	637826	7531366	106.0	2.7	1.39	1.44	1.42	1.9	17.0	21.0	0.57	0.134
LV1075C	643145	7524765	218.3	4.0	1.40	1.40	1.38	1.7	12.2	20.5	0.31	0.085
LV1085C	638694	7532809	274.4	2.5	1.47	1.44	1.42	1.3	17.2	21.4	0.31	0.040
LV1188R	643512	7522504	137.8	3.7	1.40	1.42	1.40	2.3	14.2	20.3	0.33	0.033
LV1189C	644359	7522695	173.0	4.0	1.38	1.38	1.37	1.7	10.7	20.8	0.32	0.039
LV1191C	642927	7521839	74.3	3.9	1.42	1.42	1.40	1.7	14.3	21.1	0.38	0.114
LV1195C	643950	7521538	149.1	3.8	1.42	1.41	1.39	1.9	13.8	20.6	0.40	0.208
LV1196C	644683	7521742	161.5	3.9	1.40	1.40	1.38	1.9	12.5	20.3	0.33	0.060
LV1197C	646144	7521514	123.2	4.4	1.41	1.40	1.39	1.8	12.9	20.1	0.30	0.088
LV1211C	642759	7522416	87.0	3.7	1.45	1.46	1.43	1.7	18.6	21.9	0.90	0.093
LV1212C	643118	7523199	131.2	3.5	1.37	1.40	1.38	1.7	12.7	21.8	0.38	0.060
LV1213C	642363	7523314	95.5	3.8	1.40	1.42	1.40	1.9	14.2	21.6	0.61	0.062
LV1215C	641731	7523567	40.4	3.8	1.41	1.43	1.41	2.0	15.7	20.7	1.26	0.144
LV1216C	641866	7524254	114.8	3.9	1.39	1.41	1.39	1.7	13.2	22.0	0.56	0.073
LV1217C	640517	7524666	67.6	4.2	1.48	1.49	1.46	1.5	21.8	20.4	1.11	0.107
LV1219C	640953	7524122	67.3	3.6	1.42	1.44	1.41	1.3	16.4	21.7	1.67	0.014
LV2201C	646101	7522336	110.5	4.3	1.41	1.41	1.39	1.7	13.1	20.4	0.57	0.086
LV2213C	643541	7521669	122.7	3.4	1.45	1.44	1.42	1.1	17.3	20.6	1.04	0.118
LV2223C	644051	7522227	158.2	3.5	1.39	1.39	1.38	2.0	11.7	20.5	0.29	0.019
LV2393C	645693	7523043	91.5	4.5	1.37	1.38	1.36	1.3	10.2	21.4	0.61	0.058
LV2394C	644898	7522962	191.2	4.6	1.38	1.39	1.37	1.2	11.0	20.5	0.31	0.058
LV2395C	645303	7522123	188.7	4.2	1.39	1.39	1.37	1.5	11.6	19.8	0.27	0.057
LV2503C	643967	7523322	174.9	4.2	1.38	1.38	1.37	2.0	10.5	20.4	0.29	0.045
LV2504C	643591	7523962	189.6	4.1	1.38	1.39	1.37	1.1	11.9	22.3	0.38	0.091
LV2505C	642497	7524044	132.7	3.9	1.41	1.41	1.39	2.0	13.4	21.2	0.61	0.133
LV2506C	640814	7525254	140.3	4.1	1.42	1.43	1.41	2.0	15.3	21.4	0.43	0.097
LV2507R	642242	7526503	306.3	3.8	1.39	1.40	1.38	1.7	12.3	20.8	0.30	0.084
LV2508C	643835	7526143	250.4	4.7	1.42	1.42	1.40	1.7	15.1	20.1	0.29	0.120
LV2509C	642898	7527631	354.6	4.3	1.40	1.42	1.40	1.6	14.6	19.8	0.28	0.083
LV2510C	641963	7528616	382.1	4.1	1.41	1.40	1.38	1.4	12.3	19.7	0.30	0.061
LV2511C	641498	7527586	346.5	4.0	1.40	1.40	1.38	2.1	12.6	19.5	0.29	0.034
LV2513C	640147	7528482	328.7	2.5	1.43	1.43	1.41	1.6	15.8	20.5	0.34	0.142
LV2514C	643853	7528723	437.7	4.4	1.39	1.39	1.38	2.0	11.7	18.9	0.30	0.074
LV2515C	643281	7530178	493.1	4.9	1.41	1.39	1.37	1.4	12.0	19.4	0.30	0.048
LV2516C	641681	7529523	421.0	4.3	1.46	1.42	1.40	1.2	15.0	19.9	0.30	0.112
LV2517C	641520	7530273	450.8	4.3	1.42	1.43	1.40	1.3	15.4	19.4	0.29	0.092
LV2695C	642016	7524831	163.6	4.0	1.41	1.40	1.38	1.5	12.9	21.6	0.45	0.065
LV2698C	640503	7529740	383.4	3.4	1.49	1.48	1.45	1.4	21.2	19.1	0.31	0.122
LV2705C	641186	7527050	308.4	3.8	1.44	1.43	1.40	1.1	15.3	20.5	0.29	0.032
LV2707C	640446	7525665	175.4	4.5	1.48	1.48	1.46	1.4	21.6	20.0	0.32	0.066
LV2716C	639835	7527772	280.4	2.6	1.56	1.52	1.48	0.9	25.1	23.7	0.32	0.014
RD calc	0.0093*ash% ad +1.2833											
RD PS	RD calc*(100-IM)/(100+(RD calc*(5-IM))-5)											
1.52	Anomalous											

Table 5 (continued) - Vermont Lower Seam Raw Coal Quality – Western Block

Hole	East	North	VL		Raw Quality % (adb)							
			from	thick	RD lab	RD calc	RD-PS	IM	Ash	VM	S	P
LV2709C	640923	7525836	232.4	3.8	1.43	1.42	1.40	1.4	14.6	20.7	0.30	0.049
LV2711C	641516	7525441	207.3	3.9	1.39	1.41	1.39	1.6	13.3	21.0	0.31	0.045
LV2712CR	642210	7527183	333.1	4.0	1.40	1.40	1.38	1.6	12.1	19.8	0.31	0.131
LV2714C	641673	7526197	287.9	3.8	1.39	1.39	1.37	1.1	11.8	20.7	0.31	0.032
LV2715C	643720	7527125	313.7	4.4	1.41	1.40	1.38	1.1	12.2	20.9	0.29	0.083
LV2717C	642563	7529869	467.9	4.3	1.41	1.41	1.39	0.9	13.9	19.3	0.28	0.072
LV2718C	639693	7529259	308.4	2.2	1.50	1.49	1.46	0.9	22.6	19.4	0.33	0.426
LV2720C	640669	7527727	321.7	4.5	1.41	1.41	1.39	1.0	13.8	20.2	0.29	0.092
LV2722C	640985	7528692	355.7	4.2	1.41	1.41	1.39	1.1	13.7	19.8	0.30	0.092
LV2723C	642958	7528677	417.9	4.3	1.41	1.40	1.38	1.2	12.9	18.4	0.30	0.105
LV2724C	643928	7524866	205.8	4.2	1.40	1.41	1.39	1.4	13.5	20.7	0.32	0.112
LV2725C	641994	7525797	263.8	3.9	1.39	1.40	1.38	1.0	12.9	22.0	0.30	0.076
LV2726C	640452	7526224	219.7	5.5	1.42	1.42	1.40	1.5	14.8	20.8	0.31	0.048
LV2732C	644243	7523983	189.2	4.5	1.38	1.39	1.37	1.6	11.2	20.6	0.33	
LV2733C	643122	7523765	155.8	4.1	1.37	1.38	1.36	1.5	10.0	22.0	0.32	0.078
LV2734C	643024	7526248	302.1	4.1	1.39	1.39	1.37	0.6	11.4	21.0	0.33	0.042
LV2736S	640897	7530984	438.0	2.8	1.46	1.43	1.40	1.4	15.3	19.3	0.32	0.047
LV2737C	642798	7525553	270.6	4.5	1.39	1.41	1.39	1.7	13.3	20.8	0.31	0.075
LV2738C	640229	7527099	256.4	4.2	1.47	1.46	1.44	1.5	18.9	20.5	0.29	0.009
LV2740C	645189	7523522	162.8	4.4	1.39	1.39	1.37	1.4	11.6	20.5	0.31	0.103
LV2742C	645114	7523971	39.7	**8.0**	1.39	1.38	1.36	1.4	10.0	20.7	0.62	0.089
LV2743C	644608	7523387	193.2	4.4	1.40	1.39	1.37	1.5	11.7	20.0	0.29	0.057
LV2744C	639867	7531119	365.9	2.4	**1.40**	**1.45**	1.43	1.5	18.1	19.8	0.31	0.025
LV2745C	642381	7530686	494.4	4.7	**1.36**	**1.43**	1.41	1.6	15.7	19.0	0.29	0.025
LV2746C	642714	7522894	98.9	3.6	1.41	1.39	1.38	1.7	11.9	21.2	0.49	0.059
LV2747C	642181	7522757	46.2	4.1	1.40	1.40	1.38	1.3	12.4	21.4	0.98	0.113
LV2751C	638614	7531288	200.2	2.5	1.46	1.44	1.42	1.4	17.1	20.4	0.35	0.119
LV2752C	643134	7530819	523.9	4.3	1.43	1.41	1.39	1.3	13.5	19.7	0.27	0.045
LV2756C	643800	7530915	557.1	4.6	1.40	1.40	1.38	1.4	12.0	19.2	0.31	0.095
LV2836C	641796	7531039	503.4	4.5	1.44	1.40	1.38	1.1	13.0	17.4	0.29	0.094
LV2837C	643081	7531421	557.0	4.7	1.46	1.44	1.42	1.4	16.8	19.2	0.28	0.057
LV2838C	641866	7531431	505.6	3.6	1.43	1.42	1.40	1.1	14.9	18.3	0.30	0.082
LV2839C	640382	7531537	403.5	2.6	1.50	1.50	1.47	1.7	22.8	17.9	0.31	0.035
LV2841C	640637	7532678	427.1	2.6	1.42	1.42	1.39	1.0	14.3	20.2	0.34	0.036
LV2843C	639289	7531673	309.3	2.1	1.48	1.46	1.44	1.3	19.4	20.1	0.33	0.010
LV2848C	639185	7532461	318.1	2.5	1.52	1.50	1.47	1.2	23.2	20.6	0.31	0.022
LV2849C	638609	7532089	226.5	2.7	1.44	1.44	1.42	1.6	16.9	18.5	0.32	
LV2851G	640635	7526104	242.0	3.4	1.40	1.41	1.39	1.1	13.9	20.9	0.32	0.035
LV2860G	640766	7526120	250.0	3.8	1.41	1.41	1.39	1.7	14.0	20.7	0.29	0.038
LV2862G	640650	7526231	250.7	3.8	1.41	1.42	1.39	1.3	14.3	21.0	0.30	0.027
LV2882C	637920	7532804	204.4	2.9	1.43	1.43	1.41	1.9	15.4	19.6	0.33	0.125
LV2886C	637967	7532218	175.1	3.0	1.43	1.43	1.41	1.5	15.4	20.4	0.35	0.134
LV2887C	638150	7531674	170.7	2.6	1.40	1.43	1.41	2.0	15.3	19.5	0.35	0.082
VE3818C	640777	7532005	418.2	2.6	1.41	1.41	1.39	1.5	13.4	19.2	0.38	0.034
Min				**2.1**	**1.36**	**1.38**	**1.36**	**0.6**	**10.0**	**17.4**	**0.27**	**0.009**
Max				**8.0**	**1.52**	**1.50**	**1.47**	**2.3**	**23.2**	**22.3**	**1.67**	**0.426**
Ave				**3.9**	**1.42**	**1.42**	**1.40**	**1.5**	**14.4**	**20.3**	**0.40**	**0.077**
LV2716C	639835	7527772	280.4	2.6	**1.56**	**1.52**	1.48	0.9	25.1	23.7	0.32	0.014
RD calc	0.0093*ash% ad +1.2833											
RD PS	RD calc*(100-IM)/(100+(RD calc*(5-IM))-5)											
LV2849C	40% core recovery - seam heavily faulted. Failed to core seam in subsequent hole											
LV2851G	Top 0.4m of seam faulted out.											
1.52	Anomalous											

Table 6 – Vermont Lower Seam Raw Coal Quality – Heat Affected – Western Block

Hole	East	North	VL		Raw Quality % (adb)							
			from	thick	RD lab	Calc RD	RD-PS	IM	Ash	VM	S	P
LV2518C	639144	7531108	281.6	2.2	1.57	1.54	1.51	1.2	27.3	23.1	0.32	0.023
LV2530R	639884	7530183	340.2	2.5	**1.66**	**1.54**	1.50	0.8	27.1	26.8		
VE3817C	639981	7533346	396.8	2.3	**1.57**	**1.51**	1.49	1.5	24.9	23.5	0.36	0.014
LV2721C(1)	639084	7530251	248.8	2.9	**1.75**	**1.66**	1.62	1.3	40.1	21.8	0.22	0.022
LV2842C	639981	7532208	386.7	2.5	**1.60**	**1.54**	1.52	1.5	28.1	21.9	0.28	0.010
LV2847C(2)	639565	7532946	366.1	2.3	1.60	1.58	1.55	1.5	31.6	19.5	0.34	
RD calc	0.0093*ash% ad +1.2833											
RD PS	RD calc*(100-IM)/(100+(RD calc*(5-IM))-5)											
1.52	Anomalous											
(1)	Very low core recovery											
(2)	Only selected 1.43m of 2.34m thick seam sampled.											

In MDL 303 raw S varies from low (0.3%) to high (1.7%) but ranges from 0.3% to 0.6% throughout the 3D seismic area (Figure 32). West of the 3D seismic area there is a well-defined southeast trending zone of high (>1%) S extending for 2km adjacent to the VL crop line south from VL split line. In the 3D seismic area of MDL 429 the raw S is consistently low ranging from 0.27% to 0.35% (Figure 32). S only exceeds 0.5% in MDL 429 adjacent to the crop line north of 7,530,000mN; and even in that area the maximum value is 0.6%.

The raw P of the VL is low relative to the LH and LHL seams. In MDL 303 raw P varies from 0.01% to 0.14% but most values are less than 0.1% (Figure 33). There is a northwest trending zone of high (0.11% to 0.14%) P mostly along the crop line of the VL north of Phillips Creek.

Raw P in MDL 429 falls dominantly within the range of 0.05% to 0.15%. There is a significant area in the southwest of the 3D seismic area in MDL 429 where the raw P is less than 0.05%; and apart from the bullseye of extremely high P (0.43%) centred on LV2718C there is only one area in MDL 429 north of Meadowbrook where the raw P exceeds 0.15% (Figure 33).

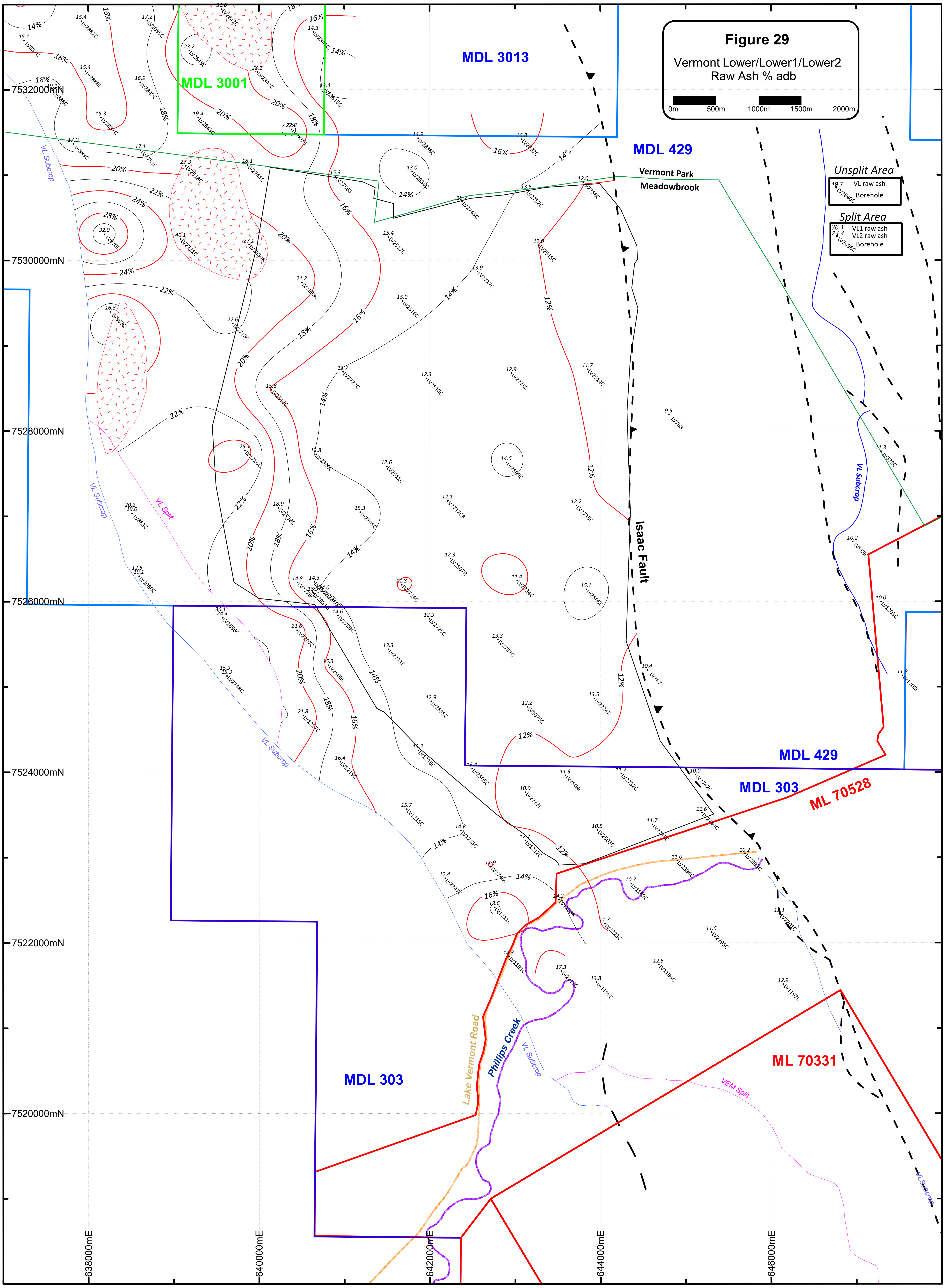


Figure 29
Vermont Lower/Lower1/Lower2
Raw Ash % adb
0m 500m 1000m 1500m 2000m
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
Unsplit Area
VL raw ash
Borehole
Split Area
VL1 raw ash
VL2 raw ash
Borehole
Isaac Fault
VL Subcrop
VL Split
MDL 303
ML 70528
ML 70331
Lake Vermont Road
Phillips Creek
VEM Split
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

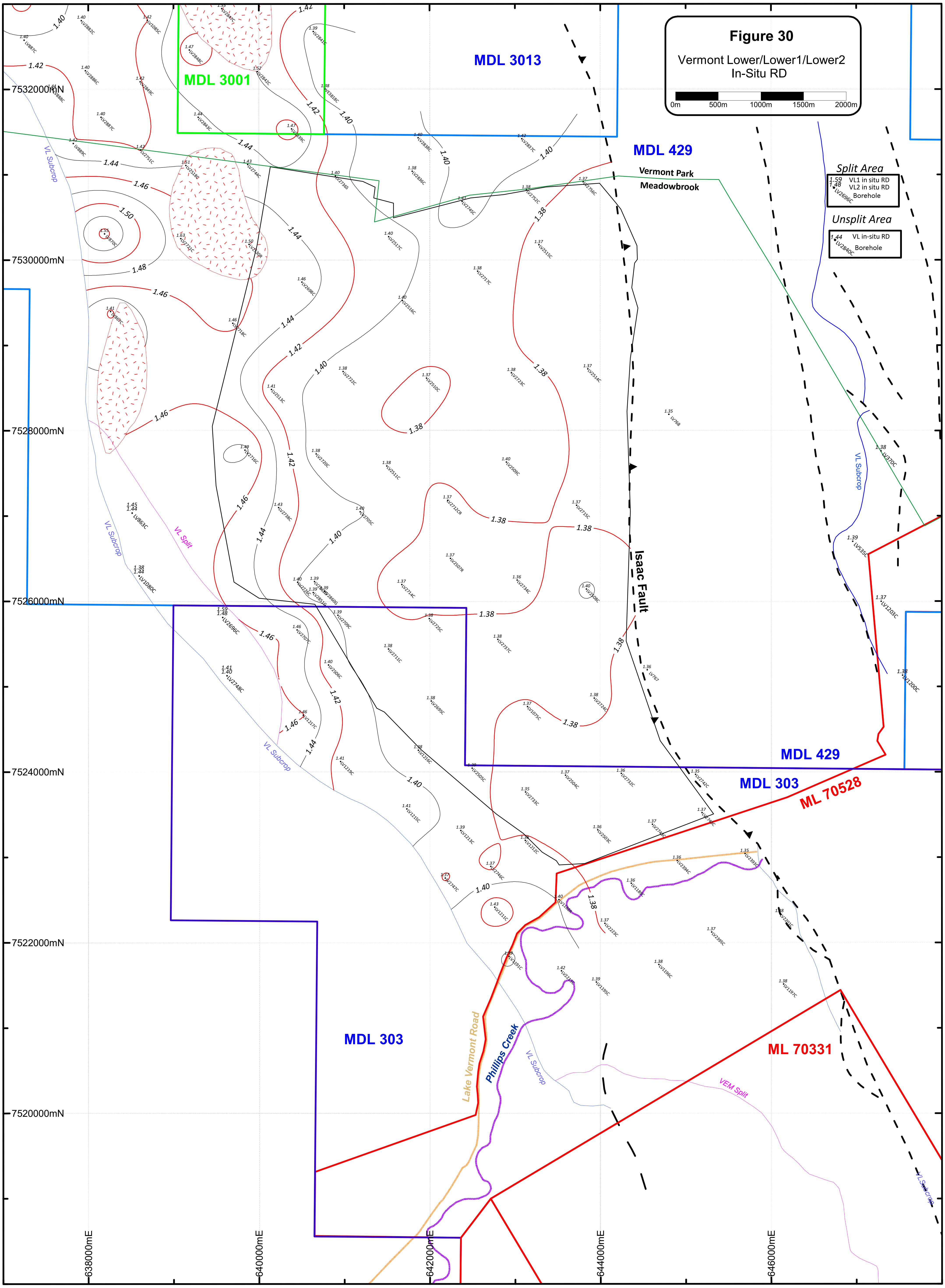


Figure 30
Vermont Lower/Lower1/Lower2
In-Situ RD
0m
500m
1000m
1500m
2000m
Split Area
VL1 in situ RD
VL2 in situ RD
Borehole
Unsplit Area
VL in-situ RD
Borehole
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
MDL 303
ML 70528
ML 70331
Isaac Fault
VL Subcrop
VL Split
VEM Split
Lake Vermont Road
Phillips Creek
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

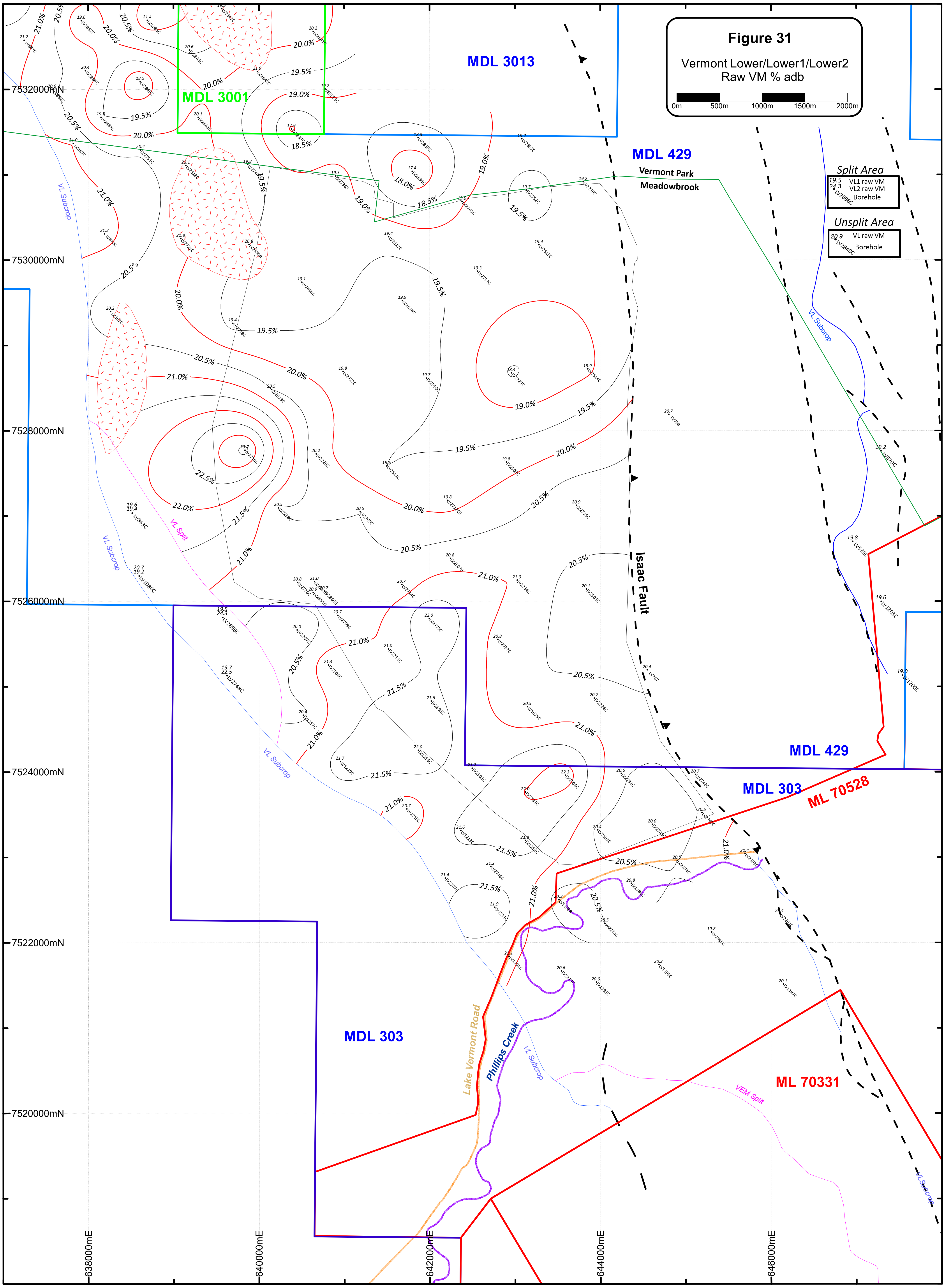


Figure 31
Vermont Lower/Lower1/Lower2
Raw VM % adb
0m
500m
1000m
1500m
2000m
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
Split Area
VL1 raw VM
VL2 raw VM
Borehole
Unsplit Area
VL raw VM
Borehole
Isaac Fault
MDL 429
MDL 303
ML 70528
ML 70331
MDL 303
Lake Vermont Road
Phillips Creek
VL Subcrop
VL Split
VEM Split
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

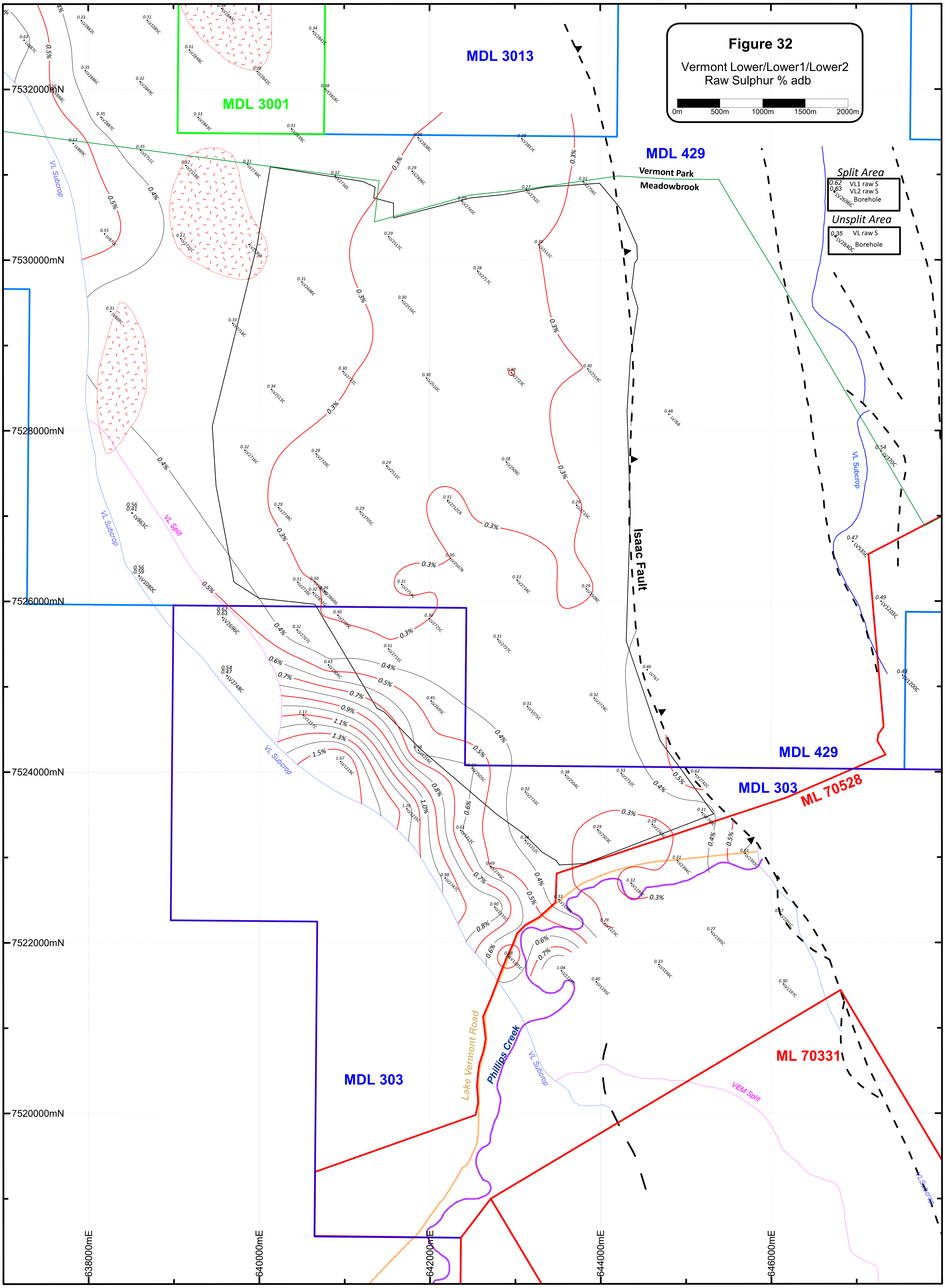


Figure 32
Vermont Lower/Lower1/Lower2
Raw Sulphur % adb
0m
500m
1000m
1500m
2000m
Split Area
VL1 raw S
VL2 raw S
Borehole
Unsplit Area
VL raw S
Borehole
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
Isaac Fault
MDL 429
MDL 303
ML 70528
ML 70331
MDL 303
Lake Vermont Road
Phillips Creek
VL Subcrop
VL Split
VEM Split
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

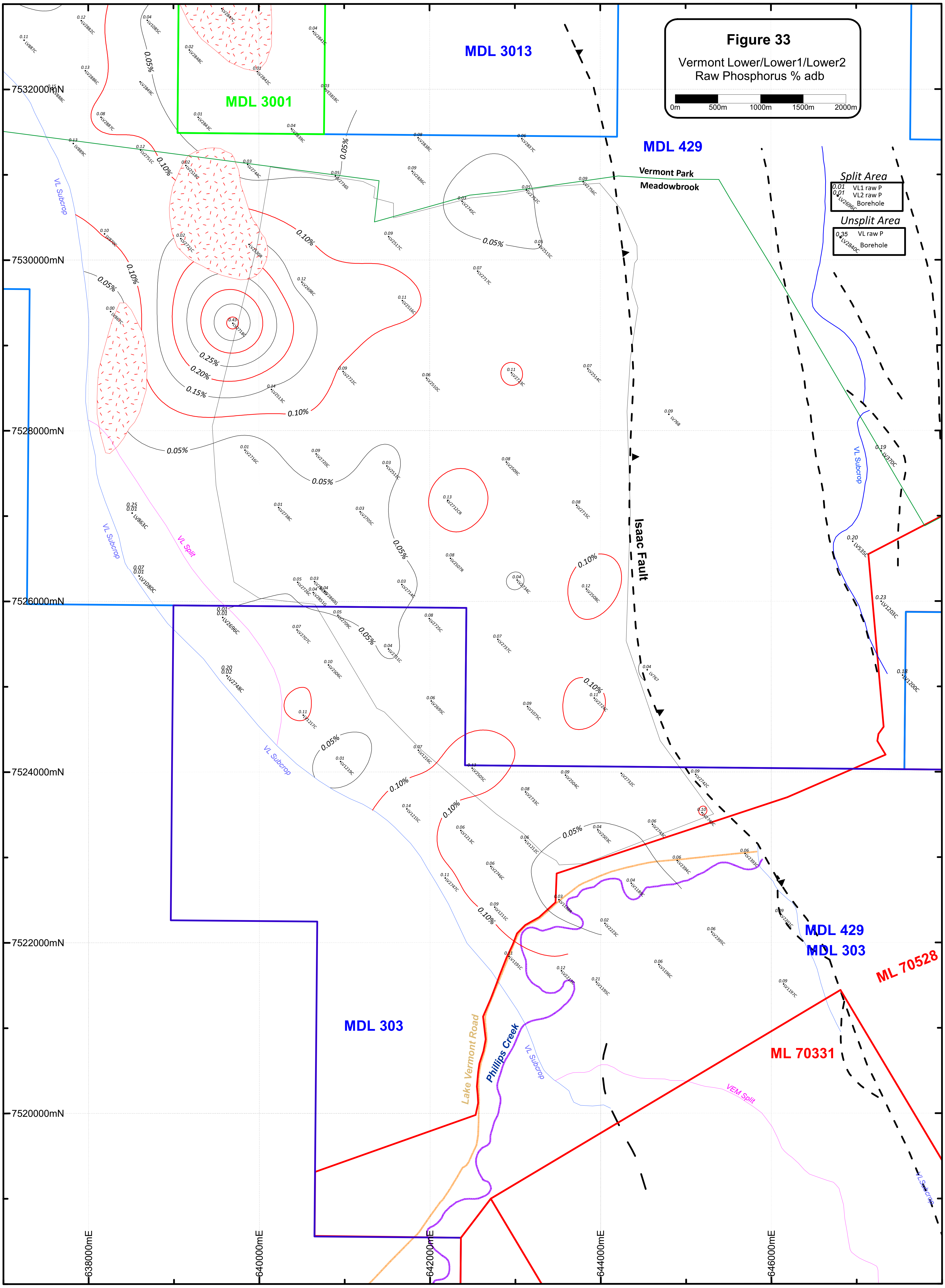


Figure 33
Vermont Lower/Lower1/Lower2
Raw Phosphorus % adb
0m
500m
1000m
1500m
2000m
MDL 3013
MDL 3001
MDL 429
Vermont Park
Meadowbrook
Split Area
VL1 raw P
VL2 raw P
Borehole
Unsplit Area
VL raw P
Borehole
Isaac Fault
VL Subcrop
VL Split
MDL 429
MDL 303
ML 70528
ML 70331
MDL 303
Lake Vermont Road
Phillips Creek
VEM Split
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE
0.10%
0.05%
0.15%
0.20%
0.25%

The Vermont Lower 1 seam (VL1) and Vermont Lower 2 seam (VL2) were sampled from holes LV863C and LV1080C in MDL 429 prior to 2020, and from LV2696C and LV2748C in MDL 303 during the 2020/2021 program (Table 7). The raw ash of the VL1 was highly variable, ranging from 12.5% to 36.1%. The raw ash of the VL2 seam was more consistent ranging from 15.3% to 24.4%. Although there are too few quality data points to contour, the raw quality data has been posted in Figures 29 to 33.

The VM are consistent with the unsplit VL in the area apart from the VL2 sample from LV2696C, which is very high relative to the high raw ash. The raw S is typically 0.5% to 0.6%, which is also consistent with the unsplit VL in the area. The one standout feature of the VL1/VL2 quality data is the low to very low (<0.02%) P of the VL2.

The samples from LV2696C have all the characteristics of carbonate rich samples associated with heat affected or faulted coal intersections. Like the VL in LV2716C the hole is isolated, and the high ash, high VM, and anomalous RDs more than likely indicate proximity to a fault zone rather than an intrusive.

Table 7 – Vermont Lower 1 Seam and Vermont Lower 2 Seam Raw Coal Quality

Hole	East	North	VL1 and VL2		Raw Quality % (adb)							
			from	thick	RD	Calc	RD-PS	IM	Ash	VM	S	P
VL1												
LV863C	638514	7527036	114.4	1.4	1.47	1.47	1.45	1.8	20.2	19.6	0.56	0.254
LV1080C	638595	7526298	41.1	0.8	1.40	1.40	1.38	1.8	12.5	20.7	0.56	0.075
LV2696C	642016	7524831	166.9	1.4	**1.68**	1.62	1.59	1.6	36.1	19.5	0.62	0.010
LV2748C	639624	7525129	65.6	1.7	1.43	1.43	1.41	1.3	15.9	19.7	0.54	0.204
VL2												
LV863C	638514	7527036	116.4	1.3	1.47	1.46	1.44	2.1	19.0	19.4	0.41	0.009
LV1080C	638595	7526298	42.7	1.2	1.46	1.46	1.44	2.2	19.1	19.2	0.59	0.007
LV2696C	639573	7525812	169.2	2.5	**1.56**	1.51	1.48	1.6	24.4	24.3	0.63	0.009
LV2748C	639624	7525129	67.8	2.5	1.44	1.43	1.40	1.2	15.3	22.5	0.47	0.018
RD calc	0.0093*ash% ad +1.2833											
RD PS	RD calc*(100-IM)/(100+(RD calc*(5-IM))-5)											
1.52	Anomalous											

Central Block

Raw coal data for the VL in the Central Block are presented in Table 8. The data show that the VL is a 4.2m to 4.3m thick, low ash (10% to 12%) coal seam throughout the Central Block of Meadowbrook. The seam in LV370C has been thickened by small scale reverse faulting and is anomalous. Raw TS is consistently low (0.4%) to moderate (0.5%). However, P is consistently very high (0.18% to 0.23%).

As pointed out previously for the LHL, raw coal CSNs of samples taken from holes drilled in 2010 are significantly higher than samples taken from older holes.

Table 8 - Vermont Lower Seam Raw Coal Quality – Central Block

Hole	East	North	RD	From	Thick	IM	Ash	VM	S	Cl	P	CSN
				m	m	% adb	% adb	% adb	% adb	% adb	% adb	
LV370C	647289	7527760	1.38	87.47	6.52	1.4	11.3	19.2	0.54	0.05	0.188	5.5
LV535C	646956	7526701	1.39	43.70	4.15	1.1	10.2	19.8	0.47	0.06	0.205	3.0
LV1203C	647290	7525999	1.37	97.28	4.32	2.1	10.0	19.6	0.49	0.07	0.234	7.5
LV1200C	647540	7525133	1.38	95.47	4.20	1.9	11.8	19.0	0.43	0.06	0.182	7.5
Min			**1.37**	**43.70**	**4.15**	**1.1**	**10.0**	**19.0**	**0.43**	**0.05**	**0.182**	**3.0**
Max			**1.39**	**97.28**	**6.52**	**2.1**	**11.8**	**19.8**	**0.54**	**0.07**	**0.234**	**7.5**
Ave			**1.38**	**80.98**	**4.80**	**1.6**	**10.8**	**19.4**	**0.48**	**0.06**	**0.202**	**6**
6.52	Anomalous											

8 COAL RESOURCES

8.1 JORC CODE REQUIREMENTS

Coal Resources have been estimated in a manner consistent with the *"Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ~ The JORC Code ~ 2012 Edition"* (the Code) and the associated "*Australian Guidelines for the estimation and classification of Coal Resources 2014 Edition"* (the Guidelines). The Code defines a mineral resource as a "concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade (or quality), and quantity that there are reasonable prospects for eventual economic extraction. All reports of Mineral Resources must satisfy the requirement that there are reasonable prospects for eventual economic extraction (i.e., more likely than not), regardless of the classification of the resource. **Portions of a deposit that do not have reasonable prospects for eventual economic extraction must not be included in a Mineral Resource.**

The Code outlines minimum standards and includes guides to standardise terminology for reporting, and checklists for criteria to be considered when reporting mineral exploration results. The Guidelines give definitions of the types of data points that can be used at different confidence levels to define the resource categories described below. All sites for which reliable drill hole data are available (one hole at each site) have been used to generate the structural models and used as Points of Observation for defining resource categories.

Holes classified as valid Points of Observation for quantity were geophysically logged, with the top and bottom of relevant seams adjusted for the geophysics. They were also accurately surveyed in the AMG co-ordinate system (not converted to MGA 94). Holes classified as Points of Observation for quality ideally had the following additional characteristics:

- The entire seam was cored
- Core recovery for the seam was greater than 90%; and
- Proximate analysis and relative density had been determined for the raw coal.

Measured Coal Resources are that part of the coal resource for which the quantity and quality can be estimated with a high level of confidence. There are sufficient data points to reliably estimate coal extent, thickness, depth range, in situ quantity and quality, and the level of confidence in the resource is high enough to support detailed mine planning and evaluation of the economic viability of the deposit. The intensity of exploration is such that estimates of Measured Coal Resources are unlikely to vary by more than 10% with further exploration.

Indicated Coal Resources are that part of the coal resource for which the quantity and quality can be estimated with reasonable levels of confidence. There are sufficient data points to reasonably estimate coal extent, thickness, depth range, in situ quantity and quality, and the level of confidence in the resource is high enough to support conceptual mine planning and the economic viability of the deposit. Estimates of Indicated Resources are unlikely to vary by more than 20% with further exploration.

Inferred Coal Resources are that part of the coal resource for which quantity and quality can only be estimated on limited geological evidence and sampling. There are sufficient data points to allow an estimate of the coal thickness and quality, but at a level which is insufficient for mine planning purposes. There is a low probability that estimates of Inferred Resources will vary by more than 30% with further exploration.

As a result of the drilling and 3D seismic carried out in 2020/2021 all resources in Meadowbrook are now classed as Measured or Indicated.

8.2 DATA VALIDATION AND CONSOLIDATION

All holes drilled in Meadowbrook from the various exploration programs were checked against the downhole geophysics for seam from/to depths and seam correlation and corrected if necessary.

The corrected summary data for one hole from each site (preferably the cored hole, but occasionally the chip hole if the deviation of the cored hole was too great) were entered into Excel spreadsheets (Appendix A1 – Western Block and Appendix A2 – Central Block). The data from Appendices A1 and A2 were then used to model overburden depth, seam thickness, interburden thickness, and RLs to the top and base of the seams being modelled. Holes in which seams were thinned by weathering or faulting were excluded from thickness models and volume calculations, as were seams thickened by faulting or intrusion.

Raw coal quality data were compiled for the LH, LHL, VL, VL1 and VL2 (Tables 3 to 8) to model raw coal quality Figures (24 to 33).

8.3 MODELLING PROCEDURE

8.3.1 Western Block

Parameters for resource estimation in the Western Block were initially gridded using Surfer 21, with Kriging as the interpolator and 10m x 10m cell sizes. The areas gridded for each seam are shown in Table 9.

Table 9 – Seam by Seam Grid Limits -10m Grids

Seam	Easting (AMG)		Northing (AMG)	
	min	max	min	max
Leichhardt	642,000	646,000	7,521,500	7,524,500
Leichhardt Lower	636,850	644,400	7,526,250	7,535,500
Vermont Lower	636,380	646,000	7,521,500	7,535,800
Vermont Lower1/2	638,000	640,300	7,524,300	7,528,120

Parameters gridded over the areas shown above were:

- RL to the top and base of each seam
- In situ RD; and
- Raw quality data (adb) for: ash, VM, S and P.

Resource polygons for each seam were then digitised from overburden contours. Surfer was used to calculate the planar areas of blanked grids within each resource polygon and the volumes between the top and base of the coal seams for each polygon. These areas and volumes were transferred directly into the resource tables for use in resource estimation. The average thickness of the seam in each polygon was calculated from the total volume and the area.

The in-situ RDs, ashes, VMs, Ss and Ps were gridded and blanked over identical areas to the resource volume grids. The RL top and RL base at each grid node were then multiplied by the parameter value, and used to calculate the mass, ash, VM, S and P at each grid node. Individual grid nodes within each blanked resource polygon were cumulated in Surfer to estimate tonnes as well as average in situ RD, ash, VM, S and P. The results were then transferred into the resource tables (Appendix B).

The resource polygons and preliminary resource tables were then supplied to Mr Adrian Buck. Mr Buck created and maintains the current structural, quality, and geotechnical models of the Lake Vermont Project outside ML 70331.

The Surfer model was re-created in using Maptek Vulcan 3D software version 2022.1, because the grids to be used within the mine planning software to generate reserves for the Meadowbrook Underground are those generated in Vulcan. For consistency between resource and reserve estimates, the resource estimates presented in this report are those generated from the Vulcan models, based on the resource polygons supplied.

The Vulcan models were initially generated from 10m grids, subsequently cut at 25m, using Triangulation (Delaunay algorithm) as interpolator for the structural model and Inverse Distance (power 1) for the quality model. Complete details on the Vulcan geological model are reported in BOYD 2022 Lake Vermont geological modelling report (BOYD, 2022). Comparison of the Surfer and Vulcan models established overall coal quantities varied by less than 3%, which was considered an independent verification of the Surfer estimates.

The resource limits and confidence levels in the resource estimates are as defined by the author.

8.3.2 Central Block

Parameters for the Central Block were gridded in 2018 using Surfer 9. Minimum Curvature was used as the interpolator for overburden and structure contours with 10m x 10m cell sizes. Kriging was used as the interpolator for other parameters, usually with 10m x 10m cell sizes; but for volume and mass calculations used to estimate resources, the cell sizes were reduced to 5m x 5m.

Once created, grids were blanked outside the effective limits of the data. Blanked grids were used to generate overburden and interburden contours, seam isopachs, and structure contours to the base of the VL.

Resource polygons were defined based on 50m overburden increments of the VL up to a maximum depth of 125m (fault bounded downdip limit). Each resource polygon was digitised and blanked. The planar areas of the blanked grids within each defined resource sub-area and the volumes between the RL top and RL base of the coal seams in the blanked grids were then generated in Surfer and transferred directly to the resource tables.

The RD was gridded (5m x 5m, kriging) and blanked over the same areas as the resource volume grids; and the volume at each individual grid node was multiplied by the RD at the identical grid node to calculate the mass at each grid node. Individual grid node masses within each blanked resource polygon were cumulated in Surfer 9 to estimate tonnes, which were then transferred directly to the resource tables. The in-situ RDs for each resource sub-area represent the average RD of all the grid nodes within that area.

RDs used to estimate resources were the laboratory RDs, which are usually converted to in situ RDs by the application of the Preston-Sanders formula prior to estimating resources. However, the Preston-Sanders formula was not applied to the Central Block RDs.

8.4 RESOURCE LIMITS

8.4.1 Western Block

Resources of the LH, LHL and the VL and its splits in the Western Block of Meadowbrook are limited to the south by the northern boundary of ML 70528, to the north by the northern boundary of Meadowbrook property, to the west by the crops of the seams and to the east by intense faulting west of the Isaac Fault. Resources of the LH extend only a limited distance into MDL 303 from ML 70528 before the seam thins and deteriorates to a remnant horizon of inferior coal and carbonaceous mudstone. Resources of the LHL are restricted to MDL 429.

The eastern limits of resources adjacent to the Isaac Fault for the LHL and VL were placed where the intensity of faulting and the size of the throws meant that, in the opinion of the author, the potential resources contained therein **"did not have reasonable prospects for eventual economic extraction"** and therefore, could not be included in the Mineral Resource. It is recognized that future advances in underground mining technology could result in the coal in these areas being added back into the resources.

The faults identified from the 3D seismic in the remainder of the 3D seismic area will have a significant impact on the tonnages of coal able to be mined in any future underground. However, any further reduction in the resource estimate due to structural considerations would only be guesswork. The coal is present in the tonnages estimated and the quality is consistent and well understood.

8.4.2 Central Block

Resources in the Central Block extend over a 3km strike length from 7,525,000mN to approximately 7,528,000mN. Over the southern half of the resource area the Rangal Coal Measures subcrop at approximately 75m depth against a reverse fault with a throw of approximately 150m, before passing outside Meadowbrook into ML 70528 (Lake Vermont property - Figure 10). The resource area is limited to the north and east by faulting. The resource area does extend slightly outside Meadowbrook into Vermont Park at the northern limit of resources

8.5 RESOURCE ESTIMATES

Resources were estimated for each seam in the Western Block as follows:

- LH - LH subcrop to VL 150m overburden; and >150m VL overburden.
- LHL – LHL subcrop to VL 150m overburden, VL 150m overburden to LHL 200m overburden; LHL 200m – LHL 300m overburden; LHL 300m – LHL 400m overburden; and LHL >400m overburden.
- VL – subcrop to 100m overburden, 100m to 150m overburden, 150m to 200m overburden, 200m – 300m overburden, 300m – 400m overburden; and >400m overburden.
- VL1/VL2 – subcrop to 100m overburden, and >100m overburden.

The resource areas in Meadowbrook were sub-divided by tenement and structural block into MDL 303, MDL 429 – Western Block and MDL 429 – Central Block. The resources for both MDL 303 (VL only) and MDL 429 – Western Block (LHL and VL) were also sub-divided into the resources within the 3D seismic area and resources outside the 3D seismic area.

Resources of the LH only occur in MDL 303. LHL resources only occur within MDL 429. VL resources occur in both MDLs. Resources of VL1 and VL2 straddle the boundary between MDL 303 and MDL 429 – Western Block along the western crop line.

Resource areas above were subdivided based on the degree of confidence in the resource estimate into Measured and Indicated.

8.5.1 Resource Estimates MDL 303

Geophysically logged holes in MDL 303 are typically 350m to 600m apart; and the distance between coal quality data points within the MDL and in adjacent tenements is typically 600m to 800m. This spread of structure drilling and 3D seismic is sufficient to model the top and bottom of the LH, VL, VL1 and VL2, especially in the 3D seismic area with high (VL) to reasonable (LH, VL1, VL2) levels of confidence.

Total resources estimated for MDL 303 are 63Mt (Table 10), 52Mt Measured and 11Mt Indicated, comprising 6Mt of LH (average thickness 2m and average in situ RD 1.53), 52Mt of VL (average thickness 4m and average in situ RD 1.39); and 6Mt of VL1 (average thickness 1.6m and average in situ RD 1.49) and VL2 (average thickness 2.5m and average in situ RD 1.45).

The Vulcan resource estimate for MDL 303 is the same as the preliminary Surfer estimate (Appendix B). In particular, the difference between the estimates for the VL in MDL 303 is less than 0.1%.

Table 10 – MDL 303 Resource Estimate

Seam	Overburden	Status	Area	Thick	Volume	RD	Tonnes	Raw Quality % (adb			
			m 2	m (ave)	$m^3 \times 10^6$	in situ	$x\ 10^6$	Ash	VM	S	P
Leichhardt	<150 to VL	Indicated	0.81	1.94	1.56	1.54	2.4	28.7	19.7	0.94	0.215
	>150 to VL	Indicated	1.05	2.02	2.12	1.52	3.2	29.7	20.2	0.57	0.183
Leichhardt	**Total**	**Indicated**	**1.86**	**1.98**	**3.68**	**1.53**	**5.6**	**29.3**	**20.0**	**0.73**	**0.197**
Vermont Lower ex 3D	0-100	Measured	2.91	3.90	11.34	1.41	15.9	15.5	21.3	0.94	0.082
	100-150(1)	Measured	1.55	3.81	5.91	1.40	8.2	14.7	21.2	0.56	0.072
	150-200(2)	Measured	0.58	4.16	2.43	1.44	3.5	19.1	20.5	0.39	0.063
Vermont Lower 3D	<150	Measured	0.79	3.87	3.05	1.38	4.2	12.9	21.6	0.53	0.085
	150-200 NW	Measured	0.71	3.85	2.74	1.39	3.8	13.7	21.2	0.44	0.066
	150-200 SE	Measured	1.81	4.23	7.67	1.37	10.5	11.3	20.9	0.34	0.064
	200-300 NW	Measured	1.02	3.86	3.95	1.38	5.5	13.8	20.8	0.32	0.063
Vermont Lower	**Total**	**Measured**	**9.38**	**3.95**	**37.08**	**1.39**	**51.6**	**14.2**	**21.1**	**0.58**	**0.073**
Vermont Lower 1	0-100	Indicated	0.53	1.49	0.80	1.46	1.2	18.8	19.9	0.66	0.137
	>100	Indicated	0.43	1.65	0.71	1.53	1.1	24.8	19.4	0.63	0.112
Vermont Lower 1	**Total**	**Indicated**	**0.97**	**1.56**	**1.51**	**1.49**	**2.3**	**21.7**	**19.6**	**0.64**	**0.125**
Vemont Lower 2	0-100	Indicated	0.53	2.53	1.35	1.44	1.9	18.0	21.9	0.61	0.041
	>100	Indicated	0.43	2.49	1.08	1.47	1.6	20.0	22.7	0.54	0.029
Vermont Lower 2	**Total**	**Indicated**	**0.97**	**2.51**	**2.43**	**1.45**	**3.5**	**18.9**	**22.2**	**0.58**	**0.036**
MDL 303	**Total**	**M + Ind**					**63**				
	(1)	Minor area in extreme SE >150m									
	(2)	Minor area in extreme NE >150m									

Leichhardt Seam

Resources of the LH in MDL 303 were assigned Indicated status in the 2017 resource statement. Geophysically logged holes that intersected the seam were drilled at 10 new sites during 2020/2021, providing greater confidence in seam continuity and thickness; but only one additional quality core, from LV2746C along the western crop line, was taken. Despite the seam being intersected at four sites in the eastern part of the resource area in 2020/2021 it was not cored, as the quality, based on the geophysics, was poor and the main target of exploration was the underlying VL.

Distance between LH quality holes in and adjacent to MDL 303 in ML 70528 ranges from 500m to 1km and because there is so little new quality data, the LH resources in MDL 303 remain classified as Indicated (Figure 34). Due to thickness and quality considerations these resources are unsuitable for underground mining; and because they are north of Phillips Creek, a natural barrier to mining, and in part overlie the proposed Meadowbrook Underground, the chance they will ever be mined is extremely low.

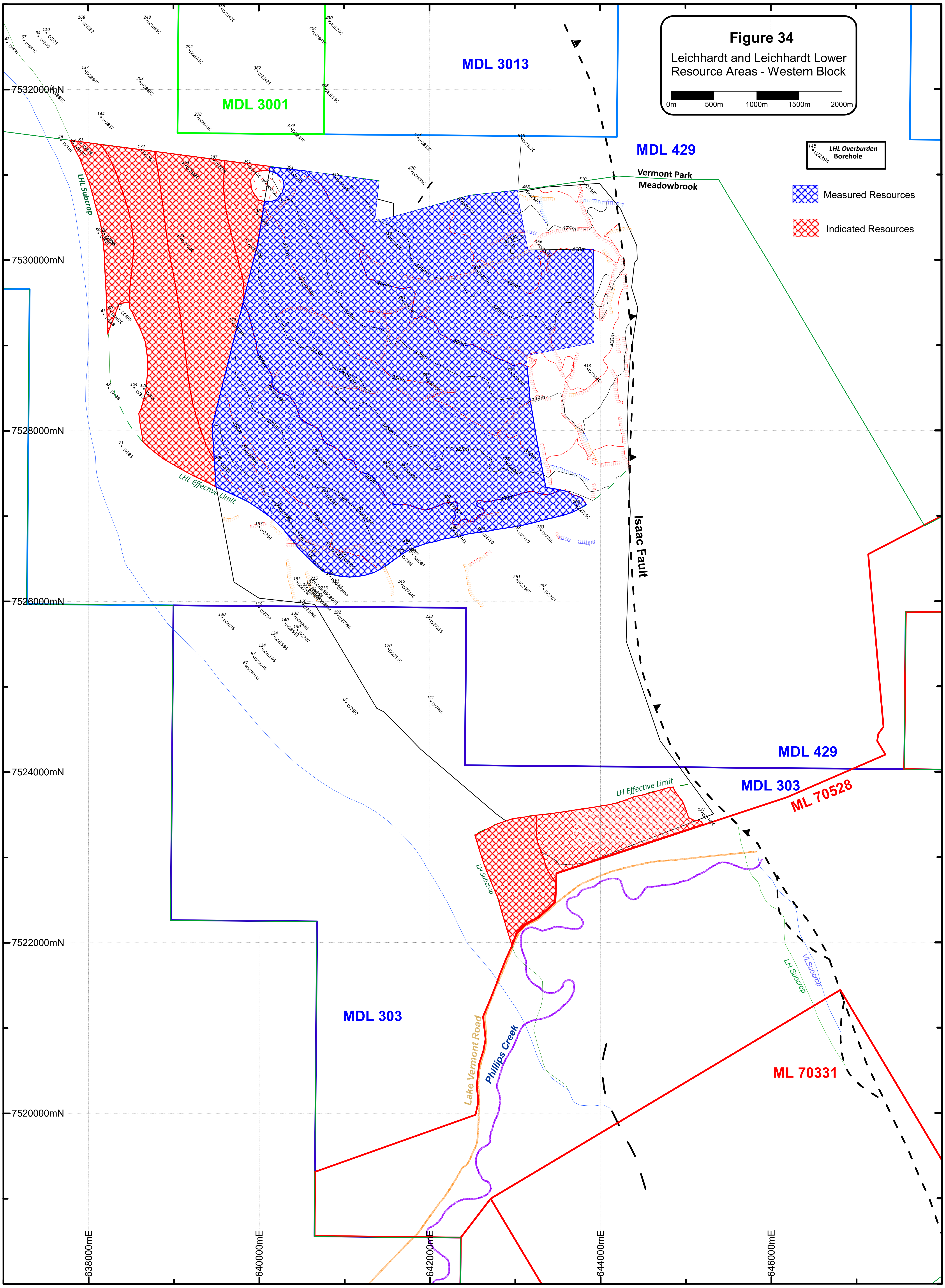


Figure 34
Leichhardt and Leichhardt Lower Resource Areas - Western Block
0m
500m
1000m
1500m
2000m
LHL Overburden Borehole
Measured Resources
Indicated Resources
MDL 3001
MDL 3013
MDL 429
Vermont Park
Meadowbrook
LHL Subcrop
LHL Effective Limit
Isaac Fault
MDL 429
MDL 303
ML 70528
LH Effective Limit
LH Subcrop
VLSubcrop
MDL 303
Lake Vermont Road
Phillips Creek
ML 70331
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

Vermont Lower Seam

Resources of the VL in MDL 303 were assigned Indicated status in the 2017 resource statement. In addition to the 3D seismic that covered a large part of the MDL, geophysically logged coal quality holes were drilled at 17 new sites during 2020/2021 in, and within 800m of the MDL, providing greater confidence in seam continuity, thickness, and quality.

Hole spacing for coal quality within the MDL is now typically 600m to 800m; and due to the confidence provided by the 3D seismic and the additional coal quality drilling, resources of the VL throughout MDL 303 have been raised from Indicated to Measured status (Figure 35). Resources within the 3D seismic area, which range from 125 to 275m overburden (Figure 10) are planned to be included in the proposed Meadowbrook Underground, while the resources from the seam subcrop up to 150m overburden could be mined by open cut, depending on project economics.

Vermont Lower 1 and Vermont Lower 2 Seams

Resources of the VL1 and VL2 in MDL 303 were assigned Inferred status in the 2017 resource statement due to a lack of structure data points north and south of a single line of holes and the lack of coal quality data points. The nearest coal quality data point was in MDL 429, 550m northwest of the MDL 303/MDL 429 boundary. Geophysically logged holes that intersected the seams were drilled at six new sites during 2020/2021, providing greater confidence in seam continuity and thickness; and two coal quality holes were drilled and sampled to provide data on coal quality within the MDL.

Distance between VL1/VL2 quality holes in and adjacent to MDL 303 in MDL 429 now ranges from 700m to 1100m; and due to the extra structure and quality data, the VL1/VL2 resources in MDL 303 have been raised to Indicated status. Because these resources are within and north of an anastomosing creek system at the headwaters of One Mile Creek, a natural barrier to mining, the chance they will ever be mined is low.

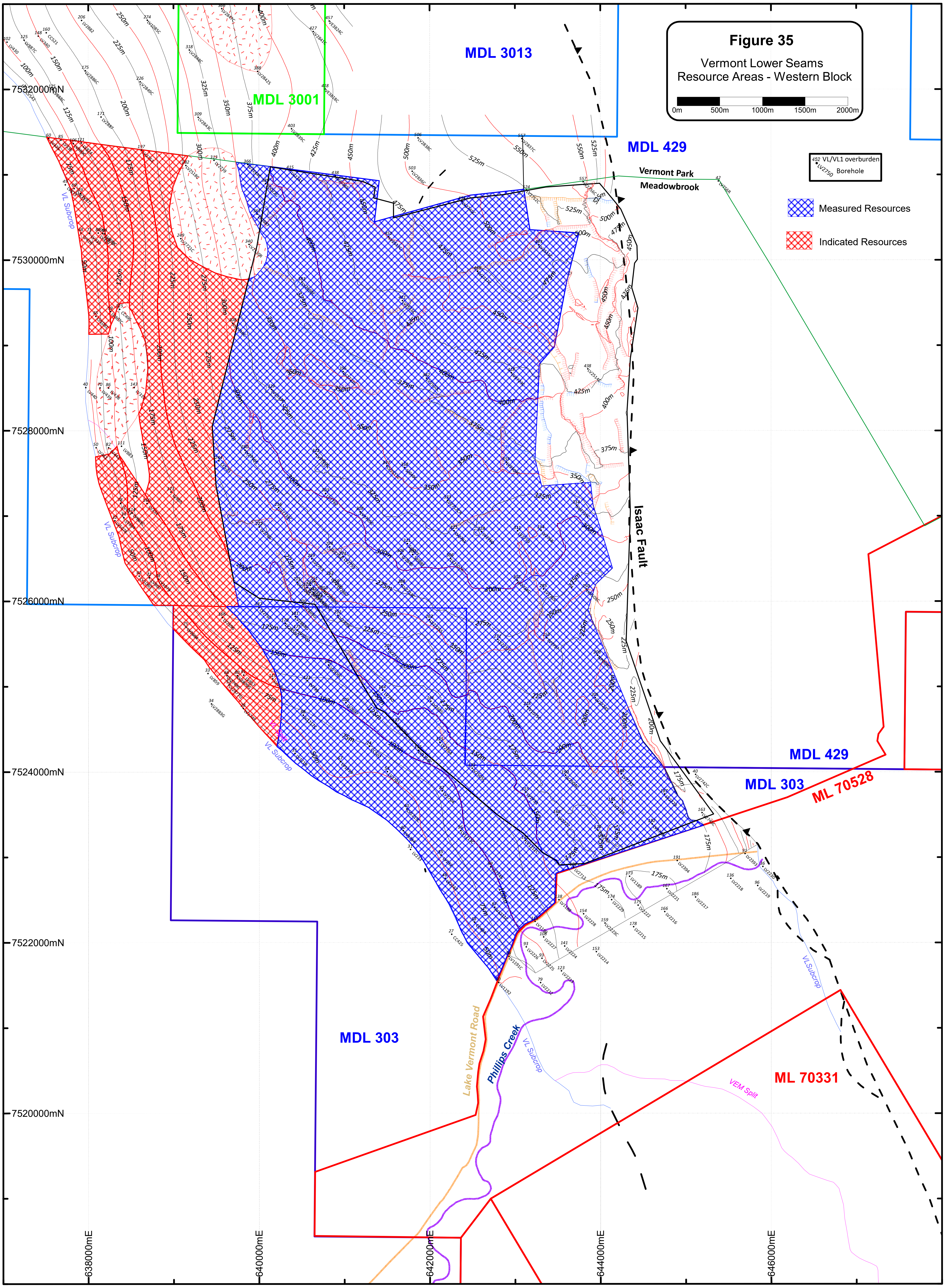


Figure 35
Vermont Lower Seams
Resource Areas - Western Block
0m
500m
1000m
1500m
2000m
VL/VL1 overburden
Borehole
Measured Resources
Indicated Resources
MDL 3013
MDL 3001
MDL 429
MDL 303
ML 70528
ML 70331
Vermont Park
Meadowbrook
Isaac Fault
VL Subcrop
Phillips Creek
Lake Vermont Road
VEM Split
7532000mN
7530000mN
7528000mN
7526000mN
7524000mN
7522000mN
7520000mN
638000mE
640000mE
642000mE
644000mE
646000mE

8.5.2 Resource Estimates MDL 429 – Western Block

Geophysically logged coal quality holes in the 3D seismic area of MDL 429 are nominally 1km apart, with a range of 800m to 1200m. Arrow has also drilled holes at six sites and more than 20 other geophysically logged holes have been drilled for structural control within the 3D footprint. This spread of structure and quality drilling and 3D seismic is sufficient to model the top and bottom of the LHL and VL and coal quality within the 3D seismic area with a high level of confidence.

Holes in the area outside the seismic footprint have a more irregular distribution, with closely spaced holes to 150m overburden on lines 700m to 800m apart and holes spaced 500m to 1300m apart elsewhere. Coal quality holes are 800m to 1500m apart within this area. The spread of structure and quality drilling within this area is only sufficient to model the top and bottom of the LHL, VL, VL1 and VL2 seams and their quality with a reasonable level of confidence.

Total resources estimated for the Meadowbrook portion of MDL 429 are 255Mt (Table 11). Measured Resources of 206Mt occur within, and in two small areas just outside the 3D seismic area and comprise 82Mt of LHL (average thickness 3.7m and average in situ RD 1.45), and 124Mt of VL (average thickness 4m and average in situ RD 1.40). Indicated Resources of 49Mt occur outside the 3D seismic area and comprise 22Mt of LHL (average thickness 3m and average in situ RD 1.45), 23Mt of VL (average thickness 2.8m and average in situ RD 1.50), and 4Mt of VL1 (average thickness 1.3m and average in situ RD 1.46) and VL2 (average thickness 1.5m and average in situ RD 1.46). The only resources that can be compared directly with the 2017 estimate are those for VL1/VL2, which are unchanged at 4Mt.

The Vulcan resource estimate for MDL 429 – Meadowbrook of 255Mt is 6Mt (2.4%) higher than the 249Mt estimated using Surfer (Appendix B). However, most of the difference between the two estimates is in the Indicated Resources outside the 3D seismic area. In the Measured Resource (3D seismic) area there was only 2% (1Mt) difference between the two estimates (82Mt Vulcan, 81Mt Surfer) for the LHL; and no difference between the two estimates (124Mt Vulcan, 124Mt Surfer) for the VL.

Table 11 - MDL 429 Resource Estimate – Western Block

Seam	Overburden	Status	Area	Thick	Volume	RD	Tonnes	Raw Quality % (adb)			
			km^2	m (ave)	m^3 x 10^6	in situ	x 10^6	Ash	VM	S	P
Leichhardt Lower ex 3D	<150VL	Indicated	0.67	2.77	1.84	1.42	2.6	17.5	21.1	0.67	0.215
	150VL-200LHL	Indicated	1.98	2.50	4.93	1.45	7.2	19.4	20.9	0.54	0.200
	200-300	Indicated	2.04	3.44	7.03	1.45	10.2	19.9	21.0	0.38	0.204
	>300	Indicated	0.44	3.64	1.59	1.44	2.3	18.3	20.8	0.35	0.158
Leichhardt Lower ex 3D	**Sub-Total**	**Indicated**	**5.12**	**3.01**	**15.39**	**1.45**	**22.3**	**19.3**	**20.9**	**0.46**	**0.199**
Leichhardt Lower 3D	200-300	Measured	3.90	2.98	11.63	1.47	17.1	24.1	19.9	0.32	0.127
	300-400	Measured	7.44	3.68	27.38	1.45	39.7	19.2	20.6	0.33	0.169
	>400	Measured	3.97	4.50	17.87	1.43	25.5	17.8	20.0	0.31	0.161
Leichhardt Lower 3D	**Sub-Total**	**Measured**	**15.31**	**3.71**	**56.87**	**1.45**	**82.4**	**19.8**	**20.3**	**0.32**	**0.158**
Leichhardt Lower	**Total**	**M + Ind**	**20.43**	**3.54**	**72.27**	**1.45**	**104.6**	**19.7**	**20.4**	**0.35**	**0.167**
Vermont Lower ex 3D	0-100	Indicated	0.62	2.62	1.62	1.48	2.4	23.3	20.8	0.44	0.108
	100-150N	Indicated	0.62	2.52	1.56	1.49	2.3	24.0	20.9	0.43	0.100
	150-200	Indicated	1.88	2.87	5.41	1.49	8.0	23.9	20.7	0.39	0.091
	200-300(1)	Indicated	2.27	2.95	6.70	1.52	10.2	24.9	20.7	0.32	0.135
Vermont Lower ex 3D	**Sub-Total**	**Indicated**	**5.40**	**2.83**	**15.29**	**1.50**	**22.9**	**24.3**	**20.7**	**0.37**	**0.113**
Vermont Lower 3D	150-200N(2)	Measured	0.29	3.80	1.12	1.44	1.6	18.3	20.8	0.38	0.045
	150-200S(3)	Measured	0.62	4.21	2.59	1.38	3.6	12.4	21.4	0.43	0.091
	200-300(4)	Measured	6.62	4.05	26.80	1.39	37.3	14.3	20.7	0.32	0.068
	300-400(2)	Measured	9.00	3.84	34.57	1.40	48.3	14.2	20.0	0.30	0.089
	>400	Measured	5.66	4.19	23.69	1.40	33.2	14.5	19.4	0.30	0.077
Vermont Lower 3D	**Sub-Total**	**Measured**	**22.19**	**4.00**	**88.77**	**1.40**	**124.0**	**14.3**	**20.1**	**0.31**	**0.079**
Vermont Lower	**Total**	**M + Ind**	**27.58**	**3.77**	**104.06**	**1.41**	**146.9**				
Vermont Lower 1	0-100	Indicated	0.50	1.25	0.41	1.44	0.6	19.4	20.3	0.54	0.140
	>100	Indicated	0.57	1.37	0.75	1.47	1.1	21.5	19.9	0.56	0.140
Vermont Lower 1	**Total**	**Indicated**	**1.07**	**1.32**	**1.16**	**1.46**	**1.7**	**20.8**	**20.0**	**0.55**	**0.139**
Vermont Lower 2	0-100	Indicated	0.50	1.43	0.63	1.45	0.9	21.0	19.8	0.48	0.020
	>100	Indicated	0.57	1.58	0.85	1.46	1.2	20.7	20.7	0.49	0.016
Vermont Lower 2	**Total**	**Indicated**	**1.07**	**1.51**	**1.48**	**1.46**	**2.2**	**20.8**	**20.3**	**0.48**	**0.018**
MDL 429 Meadowbrook	**Total**	**M + Ind**					**255**				
	(1)	Minor area >300 in NE									
	(2)	Extends slightly outside 3D area									
	(3)	Minor area <150m in SW									
	(4)	Minor area <200m in SE									

Leichhardt Lower Seam

Resources of the LHL in MDL 429 - Meadowbrook were assigned a mix of Indicated and Inferred status in 2017. The Inferred areas were in the south-western and north-eastern corners of the resource area where there was insufficient structure and quality drilling to determine a reasonable level of confidence in the estimate. Since 2017 all the south-western area and most of the north-eastern area have been covered by the 3D seismic. In addition, geophysically logged coal quality holes were drilled at eight new sites in and adjacent to the north-eastern area, and five new sites in and adjacent to the south-western area. Structure/stratigraphy holes were also drilled at 10 new sites in the south-western area to help define structure and revise the effective southern limit of the seam for mining purposes.

As a result of the 3D seismic and the additional structure/stratigraphic and quality drilling, the resources within the 3D seismic area (Figure 34) have been upgraded from Indicated and Inferred to Measured. Despite drilling holes at five new sites plus one re-drill in the area outside the 3D area, the confidence in the resources outside the seismic area has not increased enough to raise them above Indicated status.

Vermont Lower Seam

Resources of the VL in MDL 429 - Meadowbrook were assigned a mix of Indicated and Inferred status in 2017. The Inferred areas were in the south-western and north-eastern corners of the resource area where there was insufficient structure and quality drilling to determine a reasonable level of confidence in the estimate. Since 2017, geophysically logged coal quality holes were drilled at eight new sites in and adjacent to the north-eastern area, most of which has also been covered by the 3D seismic. Holes were also drilled at five new sites, including two quality holes, near the most south-westerly area. No new holes were drilled near a second Inferred area in the southwest, and because of the lack of data in the area and its proximity to the coked/heat affected zone, this area has been removed from the resource estimate.

As a result of the 3D seismic and the additional structure/stratigraphic and quality drilling, the resources within the 3D seismic area (Figure 35) have been upgraded from Indicated and Inferred to Measured. Despite drilling holes at five new sites plus one re-drill in the area outside the 3D area in the north, the confidence in the resources outside the seismic area has not increased enough to raise them above Indicated status. The addition of holes at five new sites outside the 3D seismic area in the south has extended the VL split line to the east and raised confidence in the resource estimate for the VL from Inferred to Indicated.

Vermont Lower 1 and Vermont Lower 2 Seams

Resources of the VL1 and VL2 in MDL 429 were assigned Indicated status in the 2017 resource statement. No new exploration has been undertaken within the area subsequently, although holes were drilled within the split area at two new sites in MDL 303 close to the border of MDL 429 (Figure 35). The status of the resources in MDL 429 has not changed, nor has the composite VL1/VL2 resource estimate of 4Mt.

8.5.3 Resource Estimates 3D Seismic Area

The 3D seismic area, which overlies the proposed Meadowbrook Underground straddles MDL 303 and MDL 429. Measured resources within, and in two small areas just outside the seismic area total 230Mt (Table 14), comprising 82Mt of LHL (average thickness 3.7m and average in situ RD 1.45), which are confined to MDL 429, and 148Mt of VL (average thickness 4.0m and average in situ RD 1.40). Resources within the seismic area are limited to the east by the zone of high frequency, large throw faults adjacent to the Isaac Fault (Figures 34 and 35).

The estimate from Vulcan is 2Mt (1%) higher than the 228Mt estimate generated in Surfer (Appendix B).

Table 12 – Resource Estimate - 3D Seismic Area

Seam	Overburden	Status	Area	Thick	Volume	RD	Tonnes	Raw Quality % (adb)			
			km^2	m (ave)	$m^3 \times 10^6$	in situ	$x\ 10^6$	Ash	VM	S	P
Leichhardt Lower	200-300	Measured	3.90	2.98	11.63	1.47	17.1	24.1	19.9	0.32	0.127
	300-400	Measured	7.44	3.68	27.38	1.45	39.7	19.2	20.6	0.33	0.169
	>400	Measured	3.97	4.50	17.87	1.43	25.5	17.8	20.0	0.31	0.161
Leichhardt Lower	**Total**	**Measured**	**15.31**	**3.71**	**56.87**	**1.45**	**82.4**	**19.8**	**20.3**	**0.32**	**0.158**
Vermont Lower 429	150-200N	Measured	0.29	3.80	1.12	1.44	1.6	18.3	20.8	0.38	0.045
	150-200S	Measured	0.62	4.21	2.59	1.38	3.6	12.4	21.4	0.43	0.091
	200-300	Measured	6.62	4.05	26.80	1.39	37.3	14.3	20.7	0.32	0.067
	300-400	Measured	9.00	3.84	34.57	1.40	48.3	14.2	20.0	0.30	0.089
	>400	Measured	5.66	4.19	23.69	1.40	33.2	14.3	19.3	0.30	0.077
Vermont Lower 429	**Sub-Total**	**Measured**	**22.19**	**4.00**	**88.77**	**1.40**	**124.0**	**14.3**	**20.1**	**0.31**	**0.079**
Vermont Lower 303	<150	Measured	0.79	3.87	3.05	1.38	4.2	12.9	21.6	0.53	0.085
	150-200 NW	Measured	0.71	3.85	2.74	1.39	3.8	13.8	21.2	0.45	0.065
	150-200 SE	Measured	1.81	4.23	7.67	1.37	10.5	11.3	20.9	0.34	0.064
	200-300 NW	Measured	1.02	3.86	3.95	1.38	5.5	14.4	20.9	0.33	0.060
Vermont Lower 303	**Sub-Total**	**Measured**	**4.34**	**4.01**	**17.42**	**1.38**	**24.0**	**12.7**	**21.1**	**0.39**	**0.067**
Vermont Lower	**Total**	**Measured**	**26.53**	**4.00**	**106.18**	**1.39**	**148.0**	**14.1**	**20.2**	**0.32**	**0.077**
3D SEISMIC	**Total**	**Measured**					**230**				

8.5.4 Resource Estimates – Central Block

Resources in the Central Block are restricted to the LHL and VL seams. Resources have been estimated for each seam as follows:

VL:

- Crop to 50m overburden
- 50m to 100m overburden; and
- >100m overburden

LHL:

- Crop of LHL to 100m overburden of VL: and
- >100m overburden of VL.

Resources in the Central Block of 8Mt (2Mt LHL and 6Mt VL – Table 13) have been classified as Indicated. There is more than adequate drilling, backed up by seismic, to confirm continuity of the LHL and VL throughout the defined resource area. Distance between Points of Observation for quality averages less than 1km, and coal quality, especially for the VL, which comprises 87% of the resources in the block, is very consistent from hole to hole. Analytical testing indicates the resources are likely to provide a primary semi-hard coking coal with a secondary PCI product. The resources extend slightly outside Meadowbrook (Figures 36 and 37).

There is no potential to significantly increase resources in the Central Block of Meadowbrook with additional exploration.

Table 13 – MDL 429 Resource Estimate – Central Block

Seam	Depth	Status	Area	Thick	Volume	RD	Tonnes	Raw Quality % (adb)			
	m		km^2	m	m^3x10^6		$x10^6$	Ash	VM	S	P
LHL	50-100 VL	Indicated	0.37	1.72	0.63	1.50	0.94				
LHL	>100 VL	Indicated	0.29	2.14	0.41	1.51	0.62				
LHL	**Sub-total**	**Indicated**	**0.56**	**1.86**	**1.04**	**1.50**	**1.56**	**22.2**	**18.3**	**0.95**	**0.170**
VL	0-50	Indicated	0.12	4.53	0.55	1.39	0.76				
VL	50-100	Indicated	0.64	4.57	2.94	1.38	4.06				
VL	>100	Indicated	0.19	4.91	0.94	1.38	1.30				
VL	**Sub-total**	**Indicated**	**0.96**	**4.64**	**4.43**	**1.38**	**6.1**	**10.5**	**19.5**	**0.50**	**0.210**
LHL + VL	**Total**	**Indicated**					**8**				

8.5.5 Total Resources – Meadowbrook

Resources estimated for Meadowbrook in MDL 303, MDL 429 – Western Block and MDL 429 - Central Block total 326Mt, comprising 63Mt (52Mt Measured, 11Mt Indicated) in MDL 303, 255Mt (206Mt Measured, 49Mt Indicated) in MDL 429 – Western Block, and 8Mt (all Indicated) in MDL 429 – Central Block (Tables 10, 11 and 13). A breakdown of resources in Meadowbrook, by seam, is shown in Table 14 below.

Table 14 – Total Resources in Meadowbrook by Seam

Seam	Tenement	Block	Status	Area	Thick	Volume	RD	Tonnes
				m^2	m (ave)	m^3 x 10^6	in situ	x 10^6
Leichhardt	**MDL 303**	**Sub-Total**	**Indicated**	**1.86**	**1.98**	**3.68**	**1.53**	**5.6**
Leichhardt Lower	MDL 429	Western	M + Ind	20.43	3.54	72.27	1.45	104.6
Leichhardt Lower	MDL 429	Central	Indicated	0.56	1.86	1.04	1.50	1.56
Leichhardt Lower		**Sub-Total**	**M + Ind**					**106.2**
Vermont Lower	MDL 303	Western	Measured	9.38	3.95	37.08	1.39	51.6
Vermont Lower	MDL 429	Western	M + Ind	27.58	3.77	104.06	1.41	146.9
Vermont Lower	MDL 430	Central	Indicated	0.96	4.64	4.43	1.38	6.1
Vermont Lower		**Sub-Total**	**M + Ind**					**204.7**
Vermont Lower 1	MDL 303	Western	Indicated	0.97	1.56	1.51	1.49	2.3
Vermont Lower 1	MDL 429	Western	Indicated	1.07	1.32	1.16	1.46	1.7
Vermont Lower 1		**Sub-Total**	**Indicated**					**3.9**
Vermont Lower 2	MDL 303	Western	Indicated	0.97	2.51	2.43	1.45	3.5
Vermont Lower 2	MDL 429	Western	Indicated	1.07	1.51	1.48	1.46	2.2
Vermont Lower 2		**Sub-Total**	**Indicated**					**5.7**
All seams		**Total**	**M + Ind**					**326**

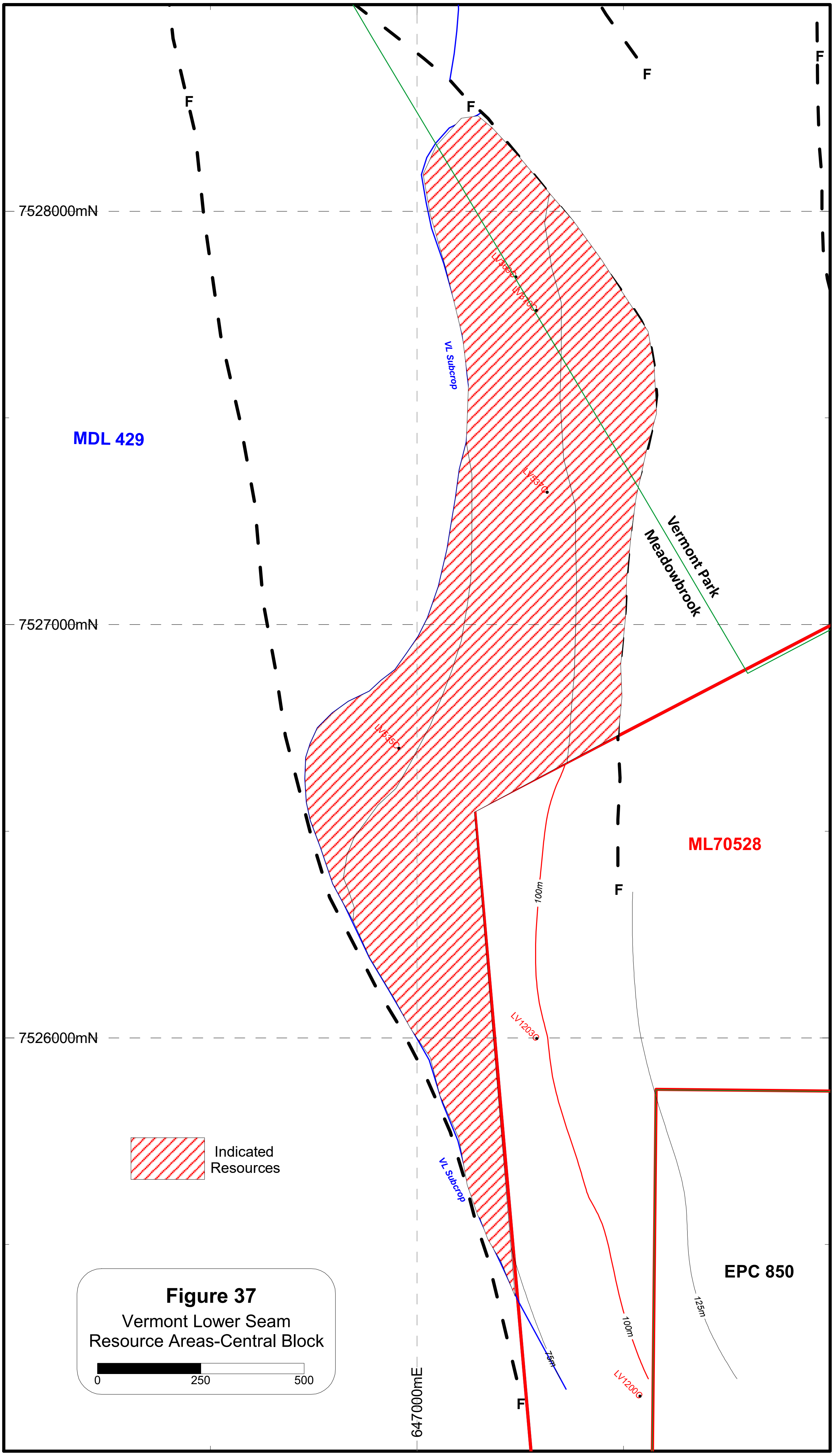


Figure 37
Vermont Lower Seam
Resource Areas-Central Block

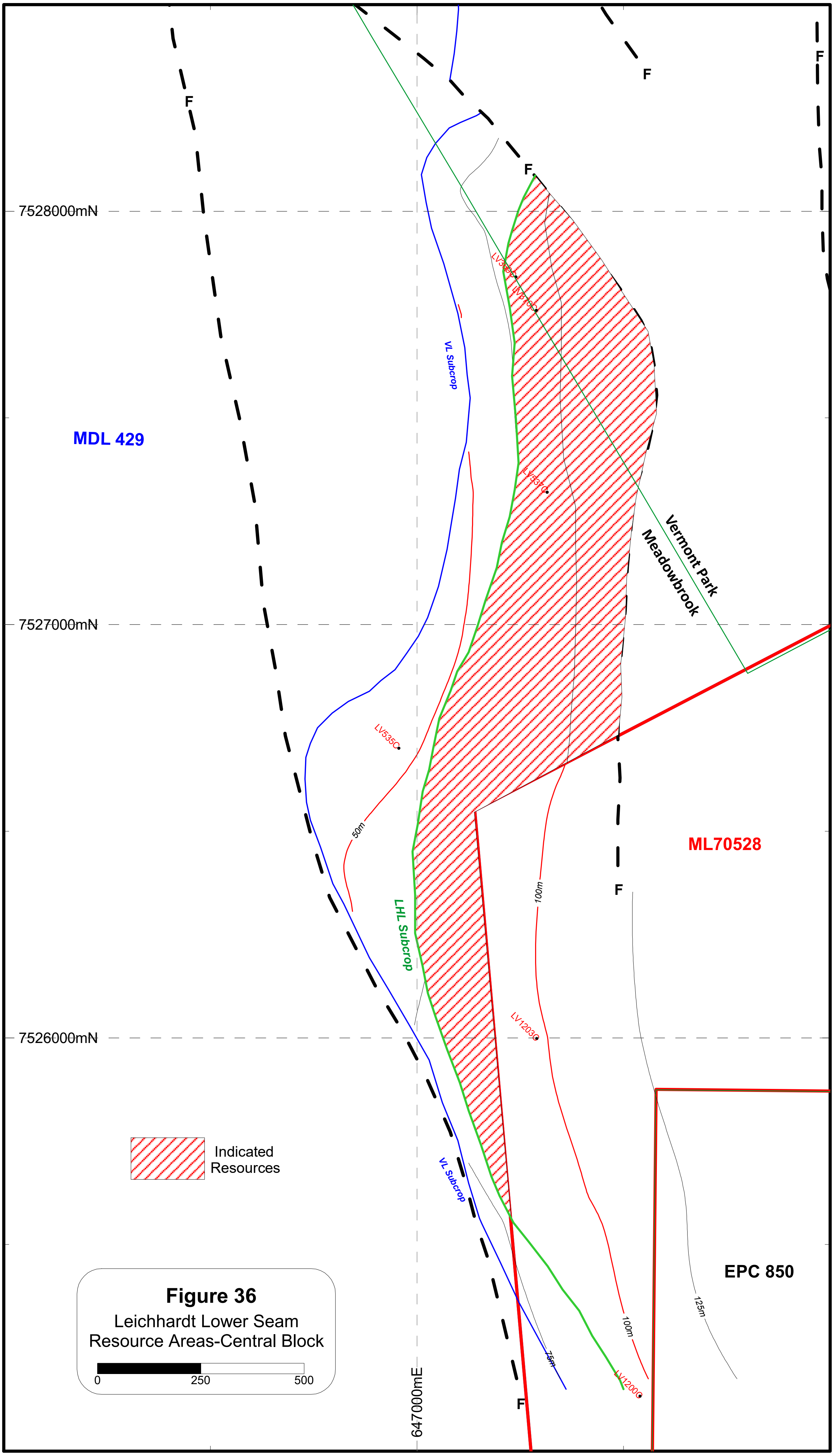


Figure 36
Leichhardt Lower Seam
Resource Areas-Central Block

8.6 RESOURCE AUDIT – WESTERN BLOCK

As described in the previous sections, resources were initially estimated in Surfer (Appendix B). The resource polygons were then imported into Vulcan and the official resource estimate was generated in Vulcan. The estimates are compared in Table 15.

Table 15 - Comparison of Vulcan and Surfer Resource Estimates

Seam	Vulcan Estimate (Mt)			Surfer Estimate (Mt)		
	MDL 303	MDL 429	TOTALS	MDL 303	MDL 429	TOTALS
Leichhardt	6		**6**	5		**5**
Leichhardt Lower		105	**105**		102	**102**
Vermont Lower	52	147	**199**	52	142	**194**
Vermont Lower1/2	6	4	**10**	6	4	**10**
TOTALS	**63**	**256**	**319**	**63**	**248**	**311**

There is only 2.3% difference between the total estimate from Vulcan (319Mt) and the total estimate from Surfer (311Mt). The estimates for MDL 303 are the same (within 1Mt). The greatest variance between the estimates is for the VL in MDL 429, 147Mt (Vulcan) compared with 142Mt (Surfer); but the difference is only 3.5%.

8.7 RESOURCE RISKS

There are two factors that could negatively affect the resource estimate in the Western Block: coking and faulting.

8.7.1 Coked and/or Heat Affected Coal

The biggest risk to the resources estimated for the Western Block are coked and/or heat affected coal, particularly for the VL. The drilling in 2020/2021 significantly increased the areas of affected coal near the northern boundary of Meadowbrook.

There are no drill holes between the area of coked VL coal near the crop line in MDL 429 and the zone of heat affected coal near the northern boundary of Meadowbrook, and it is possible the two areas are linked. However, there is no indication that the underground will be impacted.

The only significant intrusives intersected were in the Arrow hole PD022C, which remains the only hole in which the LHL was coked despite several holes being drilled around PD022C.

Areas have been sterilised from resources around holes where the seams have been coked and/or heated. The risk for the resource estimate is that the affected areas are larger than shown in Figures 34 and 35.

8.7.2 Faults

Faulting identified from the 3D seismic has already led to a sterilisation of potential resources in the 3D seismic area. The faults in the potential underground area will also have a significant impact on the reserves estimate.

While faulting is not generally a serious issue for open cut mining, it can seriously impact underground mining, especially longwall.

8.8 UPSIDE POTENTIAL

There is little potential to increase resources within the Western and Central Blocks of Meadowbrook. Seam limits, depths, thicknesses, and in-situ RDs have been defined to a high level of confidence over both areas and there is a higher potential to lose resources from the risks described above than to gain extra resources.

There is upside potential for resources in the Isaac Block between the Western Block and the Central Block. However, seismic lines across the Isaac Block indicate it is intensely folded and faulted. Any resources within the Isaac Block are likely to be in small, discontinuous fault blocks that could only be mined by open cut. However, quality data from three cores taken from the Isaac Block (two from steeply dipping sediments adjacent to the Isaac Fault) indicate that any resources that are present in the Isaac Block are likely contain high quality coking coal.

9 REFERENCES

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O’Reilly, K. W. 2013: MDL 303 (Lake Vermont) Statement of Coal Resources West of the Isaac Fault September 2013.

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O’Reilly, K. W. 2017: ML 70528/MDL 303/MDL 429/MDL 3001 (Lake Vermont Northwest) Statement of Coal Resources North of ML 70331 and West of the Isaac Fault.

O’Reilly, K. W. 2020: Lake Vermont East Statement of Coal Resources.

O’Reilly, K. W. 2022: MDL 303, MDL 429 and MDL 3001 (Lake Vermont Northwest) Statement of Coal Resources.

BOYD, 2022: Geological Modelling Report, Lake Vermont. John T. Boyd Company, July 2022.

APPENDIX A1

Hole Summary Data for Stratigraphic Modelling - Western Block

East	North	Hole	RL	RL	BUTE	BOW	BOTr	I/B	PH1			PH1-LH	PH1-LHL	LH			LH-LHL	LH-VL	*LHL1*			I/B	LHL/*LHL2*			IB	VU			I/B	VR			I/B	VL			I/B	GIR		
			LIDAR	Survey					from	to	thick			from	to	thick			from	to	thick		from	to	thick	LHL-VL	from	to	thick	VU-VL	from	to	thick		from	to	thick		from	to	thick
642523	7522241	CC424	177.26	176.7	21	28																													57.7	61.6	3.9				
642255	7522098	CC425	177.72	177.2	9	32																													**27.2**	**28.4**	**1.2**				
643079	7522537	CC427	178.02	177.6	26	44	58		61.6	61.8	0.2			71.8	73.8	2.0																									
638368	7529424	CC496	179.08	179.3	35	54																	82.1	84.0	1.9	40.7	102.7	103.6	0.9	21.1					**124.7**	**128.0**	**3.3**	79.0	207.0	229.0	22.0
641291	7524301	CC502	177.11	176.3	37	40																					47.0	47.6	0.6	26.1					73.7	77.8	4.1				
636704	7534120	CC508	191.64	192.1	32	48																									91.4	92.0	0.6	1.0	93.0	97.8	4.8	18.0	116.0	>125	>9
636917	7534239	CC516	190.03	190.4	45	55																					103.5	104.0	0.5	17.1	119.2	119.7	0.5	1.4	121.1	125.8	4.7	11.9	139.8	150.2	10.4
636759	7535808	CC517	189.84	190.5	47	68																													**60.6**	**63.9**	**4.7**	9.1	73.0	84.1	11.1
637184	7535789	CC520R	189.23	189.5	41	47																									65.2	66.0	0.8	2.2	68.2	71.8	3.6		97.0	>105.6	>8.6
637509	7532664	CC521	193.68	193.9	40	60	86	2.9	88.6	88.9	0.3		20.8										109.7	112.3	2.6	48.2					159.6	160.1	0.5	0.4	160.5	164.0	3.5	45.6	209.6	235.1	25.5
639531	7527647	CC523	178.70	179.0	42	48	174	6.4	180.4	180.6	0.2	7.0	25.3	187.6	189.0	1.4	16.9	55.2	*205.9*	*207.8*	*1.9*	0.9	*208.7*	*209.9*	*1.2*	34.3					242.8	243.4	0.6	0.8	244.2	246.8	2.6	46.9	293.7	311.8	18.1
642131	7523026	LV232	176.92	176.0	22	34																													55.4	59.3	3.9				
641773	7523092	LV233	178.50	177.6	15	35																													**31.4**	**35.2**	**3.8**				
638652	7528491	LV314	178.05	178.4	35	49	102	4.3	106.3	106.4	0.2	7.3	19.1	113.70	114.90	1.20	10.6						125.50	126.75	1.25																
638537	7528504	LV315	178.53	178.9	34	59	82	3.8	85.4	85.6	0.3	6.4	18.4	92.0	93.2	1.2	10.8	50.1					104.0	105.5	1.5	37.8	126.4	127.2	0.8	16.1					**143.3**	**147.3**	**4.0**				
638687	7527147	LV334	176.22	176.5	29	56	85	3.1	88.5	88.7	0.2	6.8		95.5	96.3	0.8		64.3									135.3	136.0	0.6	24.5					**160.5**	**163.1**	**2.6**				
637680	7531407	LV336	186.96	187.1	26	60																	**45.8**	**46.6**	**0.8**	38.5					84.6	84.9	0.3	0.2	85.1	87.8	2.7				
638014	7530316	LV339	179.98	180.3	34	52																					52.0	53.0	1.0	17.6	70.2	70.4	0.2	0.1	70.6	73.3	2.7				
637415	7532624	LV340	194.37	194.7	36	58	70	3.8	74.0	74.3	0.3		19.4										93.7	96.4	2.7	51.2	123.3	123.7	0.3	23.9	146.7	147.3	0.5	0.3	147.6	151.2	3.6				
637116	7533501	LV342	194.75	195.1	43	52																	75.0	77.8	2.8	53.2									131.0	134.5	3.5				
637536	7531423	LV426	186.28	186.6	43	59																									**59.0**	**59.4**	**0.4**	0.2	59.6	62.4	2.8				
637914	7530317	LV428	179.72	180.9	39	43																									47.0	47.3	0.3	0.2	47.5	50.1	2.6				
638117	7530316	LV429	179.86	180.3	35	54																	**49.7**	**51.8**	**2.1**	36.2	69.0	69.9	0.9	18.0	87.5	87.8	0.3	0.2	88.0	90.5	2.6				
637049	7532554	LV430	195.50	196.0	42	54																	**42.1**	**42.6**	**0.5**	59.7	76.6	77.0	0.4	25.3	101.6	102.0	0.4	0.4	102.3	105.8	3.5				
636891	7532523	LV431	195.92	196.4	42	54																					57.4	57.7	0.3	21.7	78.7	79.1	0.4	0.3	79.4	83.0	3.6				
636821	7533501	LV432	195.91	196.4	32	48																	**37.9**	**38.4**	**0.5**	51.9					89.2	89.6	0.4	0.7	90.3	94.6	4.3				
636716	7533503	LV433	196.09	196.5	30	40																									76.4	76.9	0.4	0.7	77.5	81.8	4.3				
636595	7533506	LV434	196.59	197.0	16	37																					39.8	40.0	0.2	25.0	63.6	63.9	0.4	1.1	65.0	69.0	4.0				
636901	7535002	LV436	188.13	188.6	47	57																									94.4	94.9	0.5	1.5	96.4	100.1	3.7				
636844	7534997	LV437	188.43	188.9	47	61																									88.6	89.1	0.5	1.9	91.0	94.7	3.7				
638238	7528500	LV438	179.09	179.5	36	52																	**48.1**	**49.3**	**1.3**	37.1	71.3	72.0	0.7	14.4					**86.4**	**90.3**	**3.9**				
638138	7528502	LV439	179.15	179.5	32	51																					53.6	54.7	1.1	15.1					**69.7**	**74.2**	**4.5**				
637970	7528505	LV440	179.91	180.3	32	40																									39.9	40.2	0.3	0.2	40.5	43.0	2.6				
638238	7527800	LV441	181.14	181.5	38	48																					62.1	62.5	0.4	19.9					**82.4**	**85.1**	**2.7**				
638091	7527801	LV442	179.53	179.9	30	39																					**30.7**	**31.2**	**0.5**	18.7					**49.9**	**52.9**	**3.0**				
638376	7527151	LV443	177.21	177.6	38	45																					61.1	61.8	0.7	16.6					78.4	79.6	1.2				
637249	7532000	LV542	191.62	192.1	42	61																									**60.7**	**61.2**	**0.5**	0.3	61.5	65.1	3.6				
636782	7532503	LV543	195.22	195.7	26	54																									58.8	59.4	0.6	0.2	59.5	63.3	3.7				
636592	7533111	LV545	198.36	198.8	27	32																									53.9	54.3	0.3	0.3	54.6	58.9	4.3				
636446	7533510	LV546	197.05	197.5	23	42																																	67.0	>74	>7
636532	7533859	LV548	193.33	193.7	40	44																									60.7	61.0	0.3	0.8	61.8	66.2	4.4				
636423	7533871	LV549	193.83	194.2	40	47																									47.1	47.3	0.1	1.0	48.3	52.9	4.6				
636624	7533852	LV550	193.14	193.6	39	48																									77.8	78.1	0.3	0.7	78.8	83.3	4.5				
636602	7534971	LV552	189.74	190.2	43	50																									**49.9**	**50.4**	**0.5**	1.3	**51.7**	**60.8**	**9.1**				
636536	7533507	LV553C	196.84	197.3	21	34																													52.2	56.4	4.2				
640563	7525070	LV739	173.52	174.2	9	24	39	3.6	42.6	42.8	0.2	6.8		49.6	50.6	1.0		70.2									98.6	99.1	0.5	21.7					120.8	124.8	4.0				
641446	7524960	LV740	175.33	175.6	19	51	85	3.4	88.0	88.2	0.2	5.7		93.9	94.6	0.7		69.0									139.5	140.4	0.8	23.3					163.6	167.5	3.9				
645383	7530924	LV756R	166.65	166.2	19	51																													**41.7**	**45.7**	**4.0**	32.1	77.8	87.9	10.1
644549	7525197	LV767	172.91	172.5	11	34																													**50.5**	**65.2**	**14.7**				
644802	7528191	LV768	167.00	166.5	32	39																													48.3	53.0	4.8				
639819	7525137	LV857	174.26	174.6	23	30																					70.0	71.0	1.0	20.4					**91.4**	**96.0**	**4.7**				
639400	7525155	LV859	174.64	175.0	27	>50																													**33.2**	**38.3**	**5.1**				
638713	7526277	LV860	175.04	175.4	13	39																					48.2	48.8	0.6	23.1					**72.0**	**76.4**	**4.4**				
638514	7527036	LV863C	176.24	176.5	26	46	44	5.2	48.7	48.9	0.2	5.8		54.7	55.9	1.2		58.4									96.5	97.3	0.8	17.1					**114.3**	**117.4**	**3.1**				
638417	7526981	LV864	176.67	177.1	24	49																					55.9	56.4	0.5	17.4					**73.8**	**74.9**	**1.2**				
638967	7527281	LV865	176.07	176.4	17	49	124	3.6	127.6	127.8	0.2	8.4		136.2	137.0	0.8		**33.9**									146.1	146.5	0.5	24.3					170.9	172.5	1.7				
638261	7529398	LV867C	179.37	179.78	37	47																	60.3	62.1	1.9	37.1	82.2	83.1	0.9	16.2					99.2	102.0	2.8				
638177	7529365	LV868	179.41	179.82	24	>50																	**42.7**	**44.8**	**2.1**																
638169	7530312	LV870	179.48	179.9	45	56																	57.9	60.1	2.2	36.0	77.6	78.6	1.0	17.5	95.6	95.8	0.3	0.3	96.1	98.3	2.2				
638191	7530307	LV870C	179.29	179.4	45	56																	62.1	64.9	2.8	34.4	81.0	82.0	1.0	17.3	98.5	98.8	0.3	0.5	99.3	101.4	2.2				
637835	7530838	LV871	179.55	180.2	24	48																					48.1	48.5	0.4	20.5	68.4	68.8	0.4	0.2	69.0	71.4	2.4				
637909	7530782	LV872	179.70	180.5	50	55																					58.7	58.9	0.3	19.9	78.3	78.7	0.3	0.2	78.8	81.2	2.4				
637732	7530882	LV873	179.46	180.3	44	55																									**48.0**	**48.4**	**0.4**	0.2	**48.6**	**51.0**	**2.4**				
637916	7531373	LV874	187.00	187.3	45	64																	80.9	83.4	2.5	38.0	103.1	103.4	0.3	18.1	120.9	121.2	0.3	0.2	121.4	124.0	2.6				
636769	7533841	LV878	192.38	192.8	29	50																									94.2	94.7	0.5	0.8	95.4	100.3	4.9				
636799	7534191	LV879	190.88	191.6	36	48																					87.9	88.4	0.5	17.9	104.7	105.1	0.5	1.2	106.3	110.9	4.6				
637083	7534995	LV881	187.22	188.0	40	59																					92.2	92.8	0.6	24.2	115.1	115.6	0.5	1.3	116.9	120.8	3.9				
636547	7534951	LV882	189.87	189.9	24	58																									**53.9**	**54.3**	**0.4**	1.0	**55.3**	**59.1**	**3.8**				
638389	7527819	LV883	181.14	181.7	34	53	51	4.5	55.0	55.2	0.2	5.6	15.8	60.8	62.5	1.7	8.5	48.5					71.0	71.6	0.6	39.4	93.6	94.1	0.5	16.9					111.0	113.9	3.0				

East	North	Hole	RL	RL	BUTE	BOW	BOTr	I/B	PH1			PH1-LH	PH1-LHL	LH			LH-LHL	LH-VL	*LHL1*			I/B	LHL/*LHL2*			IB	VU			I/B	VR			I/B	VL			I/B	GIR		
			LIDAR	Survey					from	to	thick			from	to	thick			from	to	thick		from	to	thick	LHL-VL	from	to	thick	VU-VL	from	to	thick		from	to	thick		from	to	thick
636702	7534982	LV884C	189.21	190.0	45	55																									69.4	69.9	0.5	1.3	71.2	74.9	3.7				
636665	7534075	LV885C	191.78	192.2	27	48																									86.5	87.1	0.6	0.8	87.8	92.1	4.3				
637012	7533505	LV886C	195.02	195.4	23	52																	53.4	55.6	2.2	63.0					117.3	117.8	0.5	0.8	118.5	122.9	4.4				
637249	7532576	LV887C	194.95	195.4	29	44	43	5.3	47.8	48.0	0.2		19.1										67.1	69.7	2.5	55.7	100.2	100.5	0.4	24.9	124.5	125.1	0.5	0.3	125.4	128.8	3.4				
637577	7531997	LV888C	193.05	193.4	54	66																	72.2	75.4	3.3	49.2					123.8	124.3	0.6	0.3	124.6	128.1	3.4				
637826	7531366	LV889C	187.48	187.9	48	60																	62.0	64.5	2.5	41.5	87.0	87.3	0.3	18.7	105.4	105.9	0.5	0.1	106.0	108.6	2.7				
643145	7524765	LV1075C	175.62	175.8	17	55	130	3.7	133.7	133.9	0.2	7.8		141.8	142.6	0.8		75.7									198.0	198.6	0.5	19.8					218.3	222.4	4.0				
638311	7526945	LV1078	176.72	176.9	16	36																													**32.5**	**35.5**	**3.0**	97.4	132.9	155.8	23.0
638819	7526262	LV1079	174.61	174.9	17	37	28																				71.7	72.3	0.6	25.8					**98.1**	**101.7**	**3.6**				
638596	7526296	LV1080	175.23	175.6	5	23																													**40.8**	**44.1**	**3.4**				
638089	7529341	LV1081	179.60	179.8	11	40																					46.6	47.5	0.9	18.0					65.5	68.4	2.9				
638694	7532809	LV1085C	189.23	189.5	38	71	220	2.9	223.2	223.6	0.4		24.7										248.3	251.6	3.3	22.7					273.2	273.7	0.5	0.7	274.4	276.9	2.5				
638232	7534521	LV1086	185.50	185.7	26	66	162	4.3	165.8	166.2	0.3		24.8						190.1	190.7	0.5	0.3	191.0	193.7	2.7	32.5					224.6	225.2	0.6	1.0	226.2	229.0	2.8				
643512	7522504	LV1188	177.64	177.4	23	37	77	5.8	82.8	83.0	0.2	9.9		92.9	95.0	2.1		42.8																	137.8	141.4	3.7				
644340	7522778	LV1189	176.29	176.1	16	42	118	6.3	124.3	124.5	0.3	8.6		133.1	135.4	2.3		37.7																	173.1	177.0	3.9				
643233	7522249	LV1190	178.57	178.7	21	38	55	4.4	59.4	59.6	0.2	10.8		70.3	72.4	2.1		42.8																	115.2	119.0	3.7				
642927	7521839	LV1191C	179.16	179.1	19	32								**26.0**	**26.3**	**0.3**		48.0																	74.3	78.3	3.9				
642805	7521535	LV1192	179.15	179.0	19	51																													**50.0**	**51.3**	**1.3**				
642759	7522416	LV1211C	178.05	177.8	16	38	21							**34.3**	**36.2**	**1.9**		50.8																	87.0	90.7	3.7				
643118	7523199	LV1212C	176.10	175.9	24	37	62	3.1	65.4	65.6	0.2	8.6		74.2	76.0	1.8		55.2																	131.2	134.7	3.5				
642363	7523314	LV1213C	176.49	176.3	19	41	21							**34.6**	**36.6**	**2.0**		58.9																	95.5	99.3	3.8				
641689	7523312	LV1214	178.49	178.4	18	40																													40.1	43.9	3.8				
641731	7523567	LV1215C	178.19	178.0	19	34																													40.4	44.2	3.8				
641866	7524254	LV1216C	177.09	177.1	11	39	28							42.3	43.1	0.8		**71.7**									88.0	88.6	0.6	26.2					114.8	118.7	3.9				
640517	7524666	LV1217C	174.23	174.2	12	29																					47.1	47.7	0.6	19.9					67.6	71.8	4.2				
640420	7524218	LV1218	175.78	175.7	17	26																													31.3	35.5	4.1				
640953	7524122	LV1219	177.49	177.3	22	37																					42.5	43.4	0.9	23.9					67.3	70.8	3.6				
643297	7521532	LV2212	180.25	180.1	22	44								**38.5**	**40.8**	**2.3**		38.4									76.0	77.0	1.0	2.1					79.1	84.2	5.1				
643541	7521669	LV2213	179.46	179.4	30	47	69	5.8	74.5	74.8	0.3			89.9	92.3	2.4		30.4									118.5	119.1	0.5	3.7					122.7	126.1	3.4				
643951	7521894	LV2214	178.11	178.0	25	46	101	5.1	105.6	105.8	0.3			120.0	122.3	2.4		31.0																	153.4	157.6	4.3				
644388	7522186	LV2215	176.58	176.4	19	44	122	5.7	127.7	128.0	0.3			138.2	140.5	2.3		37.9																	178.4	182.8	4.5				
644752	7522364	LV2216	174.86	174.8	16	33	110	4.6	114.2	114.5	0.3			123.2	125.3	2.0		41.0																	166.3	170.3	4.0				
645114	7522534	LV2217	173.66	173.5	20	45	123	4.8	127.9	128.1	0.3			137.5	139.8	2.3		46.3																	186.1	190.7	4.5				
645526	7522753	LV2218	173.34	173.3	20	35	67	6.5	73.5	73.8	0.3			85.2	87.2	2.0		48.4																	135.6	140.2	4.6				
645841	7522669	LV2219	172.63	172.4	7	38			**37.3**	**37.6**	**0.3**			49.2	51.4	2.2		44.8																	96.2	100.6	4.4				
644776	7522631	LV2221	176.09	175.8	16	34	111	6.0	117.0	117.2	0.3			126.3	128.5	2.3		38.3																	166.8	171.0	4.2				
644439	7522438	LV2222	175.92	175.6	19	49	114	7.1	120.6	120.9	0.3			130.2	132.3	2.1		42.5																	174.8	178.6	3.8				
644052	7522229	LV2223C	177.06	176.8	20	39	103	5.3	107.9	108.1	0.3			117.9	119.9	2.0		38.7																	158.6	162.1	3.5				
643580	7521960	LV2224	178.54	178.5	20	44	85	4.4	89.6	89.9	0.3			101.2	103.3	2.1		37.6																	140.9	145.2	4.3				
643314	7521817	LV2225	179.04	178.8	24	36	35	5.6	40.6	40.8	0.3			53.0	55.0	2.0		38.0																	92.9	97.3	4.4				
643129	7521950	LV2226	178.89	178.8	20	44	39	4.2	**43.2**	**43.5**	**0.3**			55.6	57.8	2.2		35.0																	92.7	96.7	4.0				
643333	7522067	LV2227	178.75	178.7	36	42	58	4.4	62.2	62.6	0.3			74.6	76.7	2.1		31.7																	108.3	112.1	3.8				
643801	7522337	LV2228	178.02	177.8	25	43	97	4.7	101.7	102.0	0.3			113.0	115.1	2.1		38.6																	**153.7**	**157.2**	**3.5**				
644130	7522503	LV2229	176.57	176.4	24	39	122							133.0	135.1	2.1		38.6																	173.7	177.1	3.4				
645902	7522891	LV2230	174.38	174.3	16	37																													**35.7**	**37.0**	**1.3**				
645693	7523043	LV2393	173.23	173.2	7	36								37.6	40.5	3.0		50.9																	91.4	95.8	4.4				
644898	7522962	LV2394	173.90	174.0	16	52	130	5.8	135.6	135.8	0.2	8.8		144.7	146.8	2.2		44.3																	191.1	195.6	4.5				
643969	7523317	LV2503	175.27	175.2	13	42	110	4.5	114.5	114.7	0.2	8.8		123.5	125.3	1.8		49.0									147.5	148.3	0.8	26.0					174.3	178.3	4.0				
643591	7523962	LV2504C	175.85	175.7	21	51	107	3.1	109.6	109.7	0.1	6.8		116.6	117.4	0.8		72.3																	189.6	193.7	4.1				
642497	7524044	LV2505C	176.53	176.5	29	42	47	4.3	51.0	51.1	0.1	5.6		56.8	57.6	0.8		75.1									107.9	108.5	0.5	24.2					132.7	136.5	3.9				
640814	7525254	LV2506C	172.94	172.9	13	29	60	3.7	63.7	63.8	0.1	5.9		69.7	70.3	0.6		70.1									117.3	117.8	0.5	22.5					140.3	144.4	4.1				
642242	7526503	LV2507R	169.44	169.4	26	45	221	4.8	225.3	225.5	0.1	8.9		234.3	234.7	0.4		71.6									268.7	269.7	1.0	36.6					306.3	310.1	3.8				
643835	7526143	LV2508C	170.54	170.6	28	44	149	5.5	154.5	154.6	0.1	12.2		166.8	167.6	0.8		**82.8**																	250.4	255.1	4.7				
642898	7527631	LV2509C	169.29	169.3	36	47			288.9	289.2	0.3		36.7	302.8	303.6	0.8	9.1	51.0	*312.7*	*314.1*	*1.4*	11.8	*325.8*	*327.4*	*1.6*	27.2									354.6	358.9	4.3				
641963	7528616	LV2510C	172.88	172.9	36	50	320	7.4	327.0	327.3	0.4		25.8										353.1	357.1	4.0	25.1									382.1	386.2	4.1				
641498	7527586	LV2511C	174.67	174.6	25	45	281	8.4	289.5	289.8	0.4		23.2										313.0	317.0	4.0	29.6									346.5	350.6	4.0				
640147	7528482	LV2513C	175.41	175.5	29	44	274	6.2	280.2	280.3	0.1		16.4										296.7	300.2	3.5	28.5					327.1	328.2	1.1	0.4	328.7	331.1	2.5				
643853	7528723	LV2514C	169.95	169.9	38	48	384	4.6	388.3	388.8	0.4		23.9						*408.7*	*409.5*	*0.8*	3.1	*412.7*	*416.4*	*3.7*	21.4									437.7	442.1	4.4				
643281	7530178	LV2515C	174.93	175.1	60	61	420	9.8	429.3	429.9	0.5		26.3										456.2	461.7	5.5	31.4									493.1	498.1	5.0				
641681	7529523	LV2516C	177.01	176.9	46	61	361	7.2	368.2	368.7	0.5		22.1										390.8	394.8	4.1	26.2									421.0	425.4	4.3				
641520	7530273	LV2517C	185.84	185.8	43	60	388	6.2	394.4	394.9	0.5		23.6										418.5	422.4	3.9	28.5									450.8	455.1	4.3				
639144	7531108	LV2518C	184.69	184.7	66	77	227	3.6	230.6	230.9	0.3		23.2										254.1	257.5	3.4	24.0					280.8	281.1	0.3	0.4	**281.6**	**283.7**	**2.2**				
639884	7530183	LV2530R	185.59	185.7	61	69	292	2.8	294.5	294.9	0.4		21.9										316.7	320.3	3.6	19.9									**340.2**	**342.7**	**2.5**				
640078	7530896	PD022C	186.63	186.4	80	90	335	4.4	339.7	340.1	0.3		25.0										**365.1**	**368.6**	**3.5**	20.1					387.7	388.2	0.4	0.5	388.6	391.6	2.9				
637853	7535612	VE2528C	185.69	185.1																															148.5	150.9	2.4				
637357	7535318	VE2530C	188.89	188.2																															124.6	128.7	4.1				
638409	7535417	VE2535	181.98	181.4																															**129.1**	**135.4**	**6.3**				
638743	7535688	VE2539C	180.52	179.8																															127.3	129.7	2.3				
638215	7535930	VE2545C	182.23	181.6																															88.5	90.3	1.8				
636827	7535557	VE2547C	189.68	189.1																															88.4	91.7	3.3				

East	North	Hole	RL	RL	BUTE	BOW	BOTr	I/B	PH1			PH1-LH	PH1-LHL	LH			LH-LHL	LH-VL	LHL1			I/B	LHL/LHL2			IB	VU			I/B	VR			I/B	VL			I/B	GIR		
			LIDAR	Survey					from	to	thick			from	to	thick			from	to	thick		from	to	thick	LHL-VL	from	to	thick	VU-VL	from	to	thick		from	to	thick		from	to	thick
639274	7535399	VE2598	180.41	179.9																															209.2	210.8	1.6				
639283	7534863	VE2600	179.74	179.4																															223.8						
639981	7533346	VE3817C	176.74	176.2	47	76	342	4.6	346.8	347.3	0.4		20.1						366.1	366.4	0.3	1.0	367.3	370.7	3.4	26.1					395.5	396.0	0.6	0.8	396.8	399.1	2.3				
640777	7532005	VE3818C	177.74	177.1	52	73	370	4.9	374.6	375.1	0.4		21.0						395.4	395.6	0.1	0.5	396.1	400.0	3.9	18.2					417.5	418.0	0.5	0.3	418.2	420.8	2.6				
639096	7533367	VE3823C	182.77	181.8	60	67	281	3.8	284.7	285.0	0.3		22.9						306.8	307.2	0.4	0.6	307.8	311.0	3.2	28.1					**337.5**	**338.0**	**0.5**	1.0	**339.0**	**342.2**	**3.2**				
640824	7532800	VE3824C	177.53	177.2	41	75	403	6.1	409.6	410.1	0.5		19.5						428.9	429.0	0.1	0.6	429.6	434.2	4.6	22.4					456.1	456.4	0.3	0.2	456.6	458.9	2.3				
639978	7530537	LV2687	186.91	187.0	51	64	309	5.1	314.1	314.5	0.5		23.3										337.8	341.5	3.7	19.7									361.2	364.0	2.8				
639143	7525700	LV2694	174.53	174.5	32	36																													**74.8**	**79.2**	**4.4**				
642013	7524830	LV2695	176.28	176.3	6	42	73	4.5	77.5	77.6	0.2	6.8	43.4	84.4	84.8	0.3	36.3	75.9					121.0	121.5	0.5	39.2									160.7	164.8	4.2				
639569	7525811	LV2696	174.47	174.2	24	40	87	2.9	90.1	90.2	0.1	7.1	40.0	97.3	97.7	0.4	32.5	68.8					130.2	130.7	0.5	35.8									**166.5**	**171.7**	**5.2**				
641017	7524812	LV2697	174.80	174.6	16	41								31.5	32.5	1.0	31.5	72.7					64.0	65.6	1.6	39.6									105.2	109.2	4.0				
640503	7529740	LV2698C	176.79	176.8	46	74	321	4.4	325.7	326.0	0.3												348.5	352.3	3.8	31.1									383.4	386.8	3.4				
641166	7523605	LV2702	178.88	178.7	16	34																																			
641503	7524003	LV2703	177.67	177.6	16	35																													54.3	58.3	4.0				
642144	7523779	LV2704	177.49	177.4	12	36																													82.5	86.4	3.9				
641186	7527050	LV2705C	173.52	173.2	19	42	243	5.1	248.1	248.3	0.3	10.0	32.3	258.3	259.5	1.2	21.0	48.9					280.6	283.7	3.1	24.8									308.4	312.3	3.8				
640450	7525664	LV2707	172.58	172.7	12	32	93	2.4	95.6	95.8	0.2	5.3	34.0	101.1	101.8	0.7	28.0	73.4					129.8	131.0	1.3	44.1									175.1	179.2	4.1				
640923	7525836	LV2709C	171.83	171.7	10	40	154	3.7	157.5	157.7	0.2	6.7	34.7	164.3	165.2	0.9	27.1	67.2					192.3	194.2	1.9	38.2									232.4	236.2	3.8	64.1	300.3	326.0	25.7
641516	7525441	LV2711C	172.4	172.4	18	43	129	3.8	132.4	132.5	0.2	5.5	37.3	138.0	138.8	0.8	31.0	68.5					169.8	170.4	0.7	36.9									207.3	211.2	3.9				
642191	7527172	LV2712C	169.80	169.8	36	50	258	4.4	262.5	262.6	0.1	11.3	38.5	273.8	274.3	0.5	26.7	59.7					301.0	304.4	3.4	29.5									334.0	338.1	4.1				
642210	7527183	LV2712CR	169.77	169.6	36	50	257	5.2	262.2	262.5	0.3		39.5						300.1	301.4	1.3	0.6	*302.0*	*303.9*	*1.9*	29.2									333.1	337.1	4.0				
643684	7522883	LV2713	176.10	176.1	27	43	120	4.7	124.7	125.0	0.3	9.3		134.4	136.4	2.0		44.4																	180.8	184.5	3.8				
641673	7526197	LV2714C	170.55	170.5	16	42	207	3.0	210.0	210.2	0.2	7.8	35.9	218.0	219.0	1.0	27.1	68.9					246.1	247.5	1.4	40.4									287.9	291.7	3.8				
643720	7527125	LV2715C	167.70	167.6	19	58	227	5.5	232.3	232.5	0.2	9.1	55.7	241.6	241.9	0.3	46.3	71.8					288.2	290.3	2.1	23.4									313.7	318.0	4.4				
639835	7527772	LV2716C	178.20	178.1	37	47	223	3.2	225.9	226.2	0.3	6.6	23.7	232.8	233.9	1.2	16.0	46.5					249.9	253.2	3.3	27.3									280.4	283.0	2.6				
642563	7529869	LV2717C	182.07	182.0	36	71	407	8.6	415.6	416.1	0.5		20.6										436.6	441.3	4.7	26.5									467.9	472.1	4.3				
639693	7529259	LV2718C	176.81	176.8	40	53	250	6.1	256.1	256.4	0.3		20.7										277.1	280.7	3.6	27.7									308.4	310.6	2.2				
640669	7527727	LV2720C	175.41	175.4	19	42	249	7.2	256.2	256.5	0.3		33.7										290.2	294.0	3.8	27.7									321.7	326.3	4.5				
639084	7530251	LV2721C	178.25	178.2	44	59	198	5.6	203.7	204.0	0.4		21.2										225.3	228.9	3.7	19.9									**248.8**	**251.8**	**2.9**				
640985	7528692	LV2722C	174.47	174.4	21	50	297	9.2	306.2	306.7	0.5		21.2										327.9	331.8	3.9	24.0									355.7	359.9	4.2				
642958	7528677	LV2723C	171.14	171.2	44	62	354	8.4	362.2	362.6	0.4		26.6										389.2	393.5	4.3	24.4									417.9	422.2	4.3				
643939	7524870	LV2724S	174.51	174.3	13	36	118	3.0	121.0	121.2	0.2	6.4		127.5	128.4	0.8		76.8																	205.2	209.5	4.3				
641998	7525786	LV2725S	173.26	173.0	24	54	177	3.6	180.5	180.7	0.2	6.8	42.7	187.4	188.3	0.9	35.0	73.3					223.3	224.2	0.9	37.4									261.6	265.6	3.9	59.7	325.3	348.7	23.5
640448	7526225	LV2726S	174.53	174.4	17	44	137	3.9	140.9	141.1	0.2	8.9	42.1	150.0	151.0	1.0	32.2	64.0					183.1	185.2	2.1	29.8									215.0	218.9	4.0				
643492	7523497	LV2727	175.85	175.7	21	40	96	3.8	99.6	99.8	0.2	10.6		110.3	112.2	1.9		56.2																	168.3	172.5	4.2				
644137	7523644	LV2728	174.64	174.5	15	45	118	5.2	123.2	123.4	0.2	9.6		132.9	134.0	1.0		50.6																	184.5	188.8	4.2				
644750	7523741	LV2729	173.10	173.2	21	43	121	5.1	126.1	126.4	0.3	8.8		135.2	137.3	2.2		49.2																	186.6	191.1	4.5				
644242	7523978	LV2732	174.17	174.1	11	36	111	5.5	116.5	116.7	0.2	6.6		123.3	124.1	0.8		64.2																	188.3	192.8	4.5				
643124	7523765	LV2733	175.97	175.8	20	51	80	4.1	84.1	84.4	0.3	6.7		91.1	92.0	1.0		63.4																	155.4	159.5	4.1				
643023.7	7526248.3	LV2734C	172.11	172.0	34	44	215	4.2	219.4	219.5	0.2	7.8	41.9	227.4	227.7	0.4	33.7	74.4					261.4	262.0	0.6	40.1									302.1	306.2	4.1				
640896.5	7530984.0	LV2736S	181.67	181.7	30	64	387	4.9	391.9	392.3	0.4		22.7										415.0	419.0	4.1	19.0									438.0	440.8	2.8				
642798	7525553	LV2737C	174.73	174.7	31	50	175	3.5	178.5	178.7	0.2	7.1		185.8	186.8	1.0		83.8																	270.6	275.0	4.5				
640229	7527099	LV2738C	176.83	176.7	20	46	186	5.1	190.6	190.8	0.3	8.9	33.2	199.8	200.9	1.1	23.2	55.5					224.0	227.1	3.1	29.3									256.4	260.7	4.2				
639474	7531168	LV2739	186.53	186.4	52	72	259	5.3	264.3	264.5	0.3		22.8										287.3	291.0	3.8	21.9									**312.9**	**316.3**	**3.3**				
645189	7523522	LV2740C	172.25	172.3	23	52	99	6.5	105.5	105.7	0.3	8.3	21.6	114.0	116.3	2.2	11.0	46.5																	162.8	167.2	4.4				
640368	7531050	LV2741	184.82	184.7	54	69	365	3.8	369.0	369.5	0.5		21.4										390.9	395.0	4.1	20.4									415.4	418.5	3.1				
645114	7523971	LV2742C	172.76	172.6	21	27																													**39.7**	**47.7**	**8.0**				
644605	7523391	LV2743	174.55	174.5	22	45	130	5.1	134.7	135.0	0.4	8.7		143.7	145.6	1.9		46.9																	192.5	196.9	4.5				
639868	7531119	LV2744C	188.32	188.4	52	78	311	4.6	316.0	316.4	0.4		24.5										340.9	344.6	3.7	21.3									365.9	368.2	2.4				
642381	7530686	LV2745C	181.92	182.0	34	54	425	2.6	427.2	427.6	0.5		29.4										457.2	461.3	4.3	33.1									494.4	499.1	4.7				
642712	7522890	LV2746	176.52	176.4	17	33	31	4.3	34.8	35.0	0.3	8.7		43.7	45.6	1.9		53.1																	98.7	102.2	3.6				
642180	7522753	LV2747	176.86	176.5	15	26																													45.8	49.9	4.1				
639624	7525129	LV2748C	174.65	174.4	13	44																													**65.6**	**70.3**	**4.7**				
639815	7524745	LV2749	174.40	174.4	13	33																													**27.5**	**31.5**	**4.0**				
640159	7525092	LV2750	173.95	174.0	10	30	27	3.3	30.3	30.4	0.2	6.5		36.9	37.5	0.7																			**114.6**	**119.0**	**4.4**				
638624	7531290	LV2751	181.38	181.5	44	61	143	5.3	148.0	148.4	0.4		23.4										171.8	175.5	3.8	21.1									196.6	199.1	2.6				
643134	7530819	LV2752C	178.62	178.9	44	55	460	7.1	467.4	468.2	0.8		19.5										488.0	492.3	4.6	31.6									523.9	528.2	4.3				
640616	7526500	LV2753	174.57	174.6	14	39	184	5.3	189.3	189.5	0.2	9.1	36.1	198.5	199.5	1.0	26.1	59.1					225.6	228.2	2.6	30.4									258.6	263.4	4.8				
640828	7526639	LV2754	174.41	174.2	14	43	203	4.8	207.8	208.0	0.2	10.3	37.3	218.3	218.7	0.4	26.7	55.4					245.3	248.0	2.7	26.1									274.1	278.0	3.9				
640983	7526524	LV2755	173.32	173.2	13	45	198	4.5	202.0	202.2	0.2	8.5	38.7	210.7	211.8	1.1	29.1	59.2					240.9	243.4	2.5	27.6									271.0	274.9	3.9				
643800	7530915	LV2756C	175.48	175.5	46	69			494.0	494.9	0.9		14.9										509.8	514.3	4.4	42.8									557.1	561.7	4.6				
643369	7525574	LV2757	172.93	172.7	26	43	160	3.3	163.5	163.6	0.2	6.9		170.5	171.3	0.7																			250.2	254.7	4.5				
643304	7526833	LV2758	168.24	168.3	30	52	223	3.6	226.9	227.1	0.2	7.6	55.6	234.7	235.2	0.5	47.5	78.7					282.7	284.4	1.8	29.5									313.9	318.4	4.5				
643029	7526826	LV2759	167.86	167.9	27	43	217	10.1	227.1	227.3	0.2	14.5	60.2	241.8	242.3	0.6	45.2	68.6					287.5	289.2	1.8	21.7									310.9	315.1	4.2				
642608	7526817	LV2760	168.30	168.4	25	67	242	4.0	245.8	246.1	0.3	8.9	54.1	255.0	255.7	0.7	44.5	72.4					300.2	302.1	2.0	26.0									328.1	332.3	4.2				
642285	7526828	LV2761	168.91	169.0	26	49	241	6.2	247.3	247.6	0.3	10.8	42.7	258.4	258.8	0.4	31.5	62.0					290.3	292.6	2.3	28.2									320.8	324.8	3.9				
640779	7527265	LV2762	175.48	175.5	16	36	232	6.4	238.7	239.1	0.4	10.6	31.8	249.7	251.0	1.3	19.9	52.2					270.9	274.7	3.9	28.5									303.2	307.4	4.2				
641607	7524569	LV2763	176.25	176.2	22	44	55	3.0	57.8	58.0	0.3	5.8		63.8	64.7	0.9																			136.9	140.6	3.7				

East	North	Hole	RL	RL	BUTE	BOW	BOTr	I/B	PH1			PH1-LH	PH1-LHL	LH			LH-LHL	LH-VL	*LHL1*			I/B	LHL/*LHL2*			IB	VU			I/B	VR			I/B	VL			I/B	GIR		
			LIDAR	Survey					from	to	thick			from	to	thick			from	to	thick		from	to	thick	LHL-VL	from	to	thick	VU-VL	from	to	thick		from	to	thick		from	to	thick
642119	7524349	LV2764	176.90	176.7	28	45	41	3.8	45.1	45.2	0.2	6.3		51.5	52.4	0.9																			124.9	128.8	3.9				
643333	7526144	LV2765	172.54	172.2	28	42	189	4.6	193.6	193.9	0.3	8.7	39.0	202.6	203.8	1.2	29.2	81.3					232.9	233.5	0.6	**51.6**									285.1	289.8	4.7				
640002	7526872	LV2766	176.81	176.8	15	48	149	4.3	153.3	153.6	0.3	8.1	33.7	161.7	162.2	0.5	25.1	59.6					187.3	190.0	2.6	31.8									221.8	224.6	2.8				
639998	7525929	LV2767	172.78	172.8	28	39	106	3.5	109.8	110.0	0.2	6.5	40.3	116.5	117.4	0.9	32.9	69.8					150.3	151.4	1.1	35.8									187.2	191.2	4.0				
643964	7525368	NP004C	174.34	174.1		45																													208.2	212.7	4.5				
641737	7526676	SJ007F	170.26	169.9	18		239	4.2	243.2	243.4	0.2	9.2	38.2	252.6	253.5	0.9	28.1	57.7					281.6	284.0	2.4	27.2									311.2	315.1	3.9				
641800	7526549	SJ008F	170.11	169.8			230	3.7	233.2	233.4	0.2	8.3	35.0	241.7	242.7	1.0	25.7	63.9					268.4	270.4	2.0	36.2									306.6	310.3	3.7				
641708	7527567	SJ049C	174.42	174.4	32	32	291	10.0	301.0	301.4	0.4		22.2										323.6	327.9	4.2	29.9									357.8	361.9	4.2				
641796	7531039	LV2836C	178.78	178.9	42	59	439	5.0	444.0	444.5	0.5		25.2										469.7	473.9	4.2	29.5									503.4	507.8	4.5				
643081	7531421	LV2837C	172.62	172.7	47	68			502.4	503.2	0.9		14.9										518.2	522.6	4.4	34.4									557.0	561.8	4.7				
641866	7531431	LV2838C	175.27	175.3	41	63	442	6.2	447.9	448.4	0.5		24.6										473.0	477.3	4.3	28.3									*505.6*	*509.1*	3.6				
640382	7531537	LV2839C	183.37	183.3	56	70			358.0	358.5	0.5		20.1										378.6	382.2	3.6	21.3					402.8	403.2	0.5	0.3	403.5	406.1	2.7				
640744	7533257	LV2840C	174.81	174.7	52	61	420	5.4	425.7	426.1	0.4		22.7										448.9	452.8	4.0	20.2					472.4	472.9	0.4	0.2	473.1	475.5	2.4				
640637	7532678	LV2841C	179.04	179.1	66	72	378	3.2	381.4	381.8	0.4		22.2										404.0	407.7	3.7	19.4					426.5	426.8	0.4	0.2	427.1	429.6	2.6				
639985	7532212	LV2842S	183.64	183.7	54	73	331	4.2	335.0	335.3	0.3		27.0										362.3	366.1	3.8	21.8					387.2	387.6	0.4	0.3	**387.9**	**390.5**	**2.7**				
639289	7531673	LV2843C	188.60	188.6	55	80	250	3.0	252.9	253.1	0.3		24.5										277.6	281.1	3.5	28.2					308.6	309.0	0.5	0.2	309.3	311.4	2.1				
641661	7526556	LV2846	170.27	170.3	17	53	232	3.7	235.2	235.4	0.2	8.3	35.0	243.6	245.0	1.4	25.4						270.4	272.7	2.3	33.3									306.0	309.8	3.8				
639565	7532946	LV2847C	181.94	181.8	48	68	311	4.1	314.9	315.3	0.4		23.3										338.6	341.9	3.4	24.2					365.1	365.7	0.5	0.5	**366.1**	**368.5**	**2.3**				
639185	7532461	LV2848C	187.77	187.7	38	71	268	2.9	271.3	271.6	0.4		19.9										291.5	294.8	3.3	23.3					317.0	317.4	0.4	0.6	318.1	320.6	2.5				
638609	7532089	LV2849C	190.36	190.4	41	72	176	4.3	179.8	180.0	0.2		22.8										202.8	206.8	4.0	19.7					225.7	226.1	0.4	0.4	226.5	229.2	2.7				
638560	7534112	LV2850C	181.14	181.2	32	53			217.9	218.2	0.3		23.8										**241.9**	**245.5**	**3.6**	27.8					271.8	272.3	0.5	0.9	273.3	275.6	2.4				
640635	7526104	LV2851G	173.45	173.2	15	38	138	2.9	141.2	141.4	0.2	7.4	51.0	148.8	149.7	0.9	42.7						192.3	196.8	4.5	45.2									**242.0**	**245.4**	**3.4**				
640703	7526034	LV2852	171.65	171.5	15	36	134	3.3	137.4	137.5	0.2			161.0	162.5	1.5	41.0		199.0	200.0	1.0		203.5	204.7	1.2	38.3									243.0	246.6	3.6				
640562	7526161	LV2853	173.85	173.9	15	39	132	9.2	141.2	141.3	0.2	8.2	39.2	149.6	150.2	0.6	30.4						180.6	182.6	2.0	45.4									228.0	232.8	4.7				
640041	7525446	LV2854G	173.29	173.2	21	42	82	5.5	87.5	87.7	0.2	4.6	36.3	92.3	92.9	0.7	31.1						124.0	125.9	1.9																
638934	7534286	LV2855	179.82	179.9	26	76	215	3.3	217.8	218.1	0.3		21.7						239.1	239.5	0.4	0.3	239.8	242.2	2.4	22.2					**263.0**	**263.5**	**0.5**	0.9	**264.4**	**266.6**	**2.2**				
640308	7525743	LV2856G	172.88	172.7	10	33	95	6.3	101.0	101.1	0.2	7.0	38.7	108.1	109.0	0.9	30.8						139.8	141.1	1.4	37.9	154.3	154.8	0.6						179.0	183.2	4.2				
638855	7533726	LV2857	184.09	184.1	45	62	260	3.9	264.2	264.5	0.4		25.1										289.6	292.9	3.4	21.5					313.1	313.6	0.5	0.9	314.4	316.7	2.3				
640182	7525589	LV2858G	174.10	174.0	8	38	91	4.2	95.2	95.3	0.1	8.2	38.9	103.5	104.6	1.1	29.6						134.2	136.3	2.1																
640601	7526189	LV2859	173.97	174.0	18	43	144	3.3	147.4	147.5	0.2	8.1	49.3	155.6	156.2	0.6	40.7						196.8	199.1	2.3	40.1									239.2	243.8	4.6				
640766	7526120	LV2860G	172.33	172.0	12	37	172	5.9	177.4	177.5	0.1	7.9	35.6	185.4	186.0	0.7	27.1						213.2	215.2	2.0	34.8									250.0	253.8	3.8				
638727	7534886	LV2861	180.29	180.3	29	69	141	7.3	148.3	149.7	1.4		24.6						173.3	173.8	0.6	0.5	174.3	176.9	2.7	28.8					**202.0**	**202.6**	**0.5**	**3.2**	**205.7**	**209.5**	**3.8**				
640650	7526231	LV2862G	174.06	173.9	14	37	175	4.0	178.5	178.7	0.2		36.5										215.1	217.2	2.1	33.5									250.7	254.5	3.9				
638132	7535137	LV2863	186.78	187.4	16	68	113	3.8	116.8	117.1	0.3		23.5						139.9	140.3	0.4	0.3	140.6	143.1	2.5	32.3					173.7	174.1	0.5	1.2	175.3	177.3	2.0				
637367	7534983	LV2864	187.94	187.9	31	63			73.4	73.7	0.4		23.1						96.1	96.5	0.4	0.3	96.8	99.3	2.5	54.3					151.1	151.7	0.6	1.8	153.5	157.6	4.1				
638012	7534617	LV2865	185.90	185.8	33	60	161	2.0	163.0	163.4	0.4		24.1						186.4	186.8	0.4	0.8	187.5	190.6	3.1	41.9					230.7	231.3	0.6	1.3	232.5	235.7	3.2				
640836	7526292	LV2866	172.81	172.5	14	37	186	3.3	189.6	189.8	0.2	8.7	34.2	198.5	199.2	0.7	24.8						224.0	225.8	1.9	35.7									261.5	265.4	3.9				
640901	7526199	LV2867	171.78	171.7	12	37	184	3.0	186.7	186.8	0.2	7.9	34.6	194.8	195.5	0.8	26.0						221.5	223.5	2.0	35.5									259.0	262.9	3.9				
640425	7525822	LV2868G	172.46	172.4	12	34	99	3.6	102.4	102.5	0.2	6.1	35.7	108.6	109.4	0.8	28.9						138.2	139.4	1.2	42.1									181.5	185.7	4.2				
640515	7525962	LV2869G	172.21	172.2	11	35	121	4.0	124.5	124.7	0.2	5.3	35.1	129.9	130.3	0.4	29.4						159.7	161.9	2.2	37.6									199.5	203.5	4.0				
638376	7533422	LV2870C	189.18	189.2	27	65	215	5.5	221.0	221.4	0.4		29.4										250.8	254.8	4.0	24.6					277.7	278.3	0.6	1.0	279.3	281.8	2.5				
637098	7534547	LV2871	188.21	188.2	15	60													62.5	62.9	0.5	0.2	63.1	65.4	2.3	69.0					132.5	133.0	0.5	1.5	134.4	138.7	4.3	14.3	153.0	174.3	21.3
637424	7534400	LV2872C	186.54	186.6	20	46	85		96.2	96.4	0.2		26.2						121.7	122.0	0.3	0.5	122.5	124.7	2.2	57.2					179.8	180.6	0.8	1.4	181.9	185.6	3.7				
637358	7533918	LV2873C	189.80	189.8	33	52	76	5.1	81.1	81.4	0.3		26.3						107.3	107.5	0.3	0.1	107.6	110.1	2.5	59.8					168.5	169.1	0.6	0.9	170.0	173.8	3.8				
639937	7525349	LV2874G	173.44	173.4	14	41	52							62.1	62.8	0.7	34.0						96.7	99.2	2.5																
639846	7525241	LV2875G	173.70	173.8	14	42								35.3	36.0	0.8	30.7						66.7	68.5	1.8		91.4	91.8	0.5												
639746	7525130	LV2876G	174.23	174.3	11	37																													**80.0**	**84.4**	**4.5**				
639647	7525019	LV2877G	174.93	174.9	12	36																													**50.5**	**54.9**	**4.4**				
639546	7524909	LV2878G	175.31	175.2	12	38																																			
637979	7534040	LV2879C	185.78	185.8	29	54	154	5.1	158.6	159.1	0.5		31.9						190.1	190.6	0.5	0.4	191.0	194.4	3.4	34.9					227.5	228.2	0.7	1.1	229.3	233.4	4.1				
637951	7533607	LV2880	189.31	189.2	26	67	167	2.0	168.7	169.1	0.4		26.0										195.1	198.8	3.7	29.1					226.3	226.9	0.6	1.0	227.9	231.0	3.1				
637579	7533314	LV2881	192.68	192.5	13	51	117	2.1	118.9	119.2	0.3		26.1										145.2	148.3	3.0	48.4					195.1	195.7	0.7	0.9	196.6	200.0	3.4				
637923	7532808	LV2882	190.67	190.5	26	69	136	5.0	141.5	141.8	0.4		26.1										167.9	170.7	2.8	35.4					204.8	205.3	0.6	0.7	206.0	208.9	2.9				
639442	7524798	LV2883G	175.65	175.5	11	37																													**34.0**	**36.1**	**2.1**				
636719	7532971	LV2884	197.78	197.7	14	38																									70.8	71.2	0.4	0.3	71.5	75.2	3.7				
637188	7533043	LV2885C	195.79	195.7	17	59	52	6.4	58.4	58.6	0.2		23.3										81.9	84.2	2.3	57.5					140.4	141.0	0.6	0.7	141.7	145.2	3.5				
637967	7532218	LV2886C	192.72	192.7	27	68	110	3.4	112.9	113.3	0.4		23.6										136.9	139.5	2.6	35.6					174.4	174.8	0.5	0.3	175.1	178.1	3.0				
638151	7531677	LV2887	187.02	186.9	18	67	114	6.0	120.2	120.6	0.4		23.3										143.9	146.6	2.7	24.1					170.1	170.5	0.4	0.2	170.7	173.2	2.5				
Min					**5**	**23**		**2**				**5**	**15**	**26**		**0.3**	**9**	**30**			**0.1**	**0.1**	**38**		**0.5**	**18**			**0.2**	**2**			**0.1**	**0.1**	**27**		**1.2**				
Max					**80**	**90**		**10**				**15**	**60**	**303**		**3.0**	**48**	**84**			**1.9**	**11.8**	**518**		**5.5**	**69**			**1.1**	**37**			**1.1**	**3.2**	**557**		**14.7**				
Ave					**28**	**49**		**5**				**8**	**29**	**133**		**1.2**	**29**	**56**			**0.6**	**1.3**	**231**		**2.7**	**33**			**0.6**	**20**			**0.5**	**0.7**	**188**		**3.7**				
34.0	Weathered																																								
50.5	VL split																																								
205.7	Coked/heat affected and/or intruded																																								
39.7	Faulted or steeply dipping																																								

APPENDIX A2

Hole Summary Data for Stratigraphic Modelling – Central Block

Hole Summary Data for Stratigraphic Modelling - Central Block

Hole	East	North	RL	DTM	TD	BOTe	BOW	LHL			I/B	VL		
	m	m						from	to	thick		from	to	thick
CC500	647206	7525548	168.7	168.1	200.9	22	47	**46.8**	**47.3**	**0.5**	27.0	74.3	78.9	4.6
CC501	647555	7525603	168.3	167.8	125.5	46	48	83.3	84.4	1.1	24.6	109.0	113.1	4.1
CC505	647106	7528992	165.0	164.6	125.0	17	65					73.5	77.4	3.9
CC506	647346	7526674	166.4	165.5	125.0	18	30	71.5	73.0	1.5	24.7	97.7	102.0	4.3
CC510	647867	7529234	163.6	163.2	399.0	45		306.9	310.2	3.3	25.9	336.1	340.4	4.3
CC514	646135	7532579	165.3	165.6	125.0							64.0	69.0	5.0
CC515	646673	7532468	164.4	164.9	358.2	37	63					**192.5**	**200.0**	**7.5**
LV249	647199	7526615	166.9	166.1	96.0	18	34	59.4	60.7	1.3	27.3	88.0	92.5	4.5
LV250	646769	7526307	168.0	167.4	46.0	35	40					**36.3**	**40.0**	**3.7**
LV311	646786	7530767	**182.0**	163.7	108.0	49	65					97.9	103.2	5.3
LV323	647140	7525970	**171.3**	167.6	138.0	42	48	59.4	60.7	1.3	27.0	87.8	92.1	4.3
LV325	647039	7525984	**171.8**	167.8	114.0	41	53	**52.9**	**53.1**	**0.3**	28.9	82.0	86.0	4.0
LV348	646994	7529490	**168.4**	164.4	186.0	47	73					169.0	172.9	3.9
LV350	646755	7529515	**168.8**	164.8	114.0	48	54					98.2	102.5	4.3
LV353	647430	7527512	**168.6**	164.5	132.0	34	39	97.8	99.8	2.0	22.4	122.2	126.8	4.6
LV354	647381	7527593	**168.5**	164.4	120.0	40	46	80.4	82.3	1.9	24.8	107.1	112.3	5.2
LV364	646633	7529527	**168.9**	164.9	102.0	44	53					86.9	92.2	5.3
LV365	646540	7531620	**168.0**	164.2	120.0	44	52					**51.2**	55.5	4.3
LV368	647269	7527759	**169.1**	164.8	102.0	24	40	58.3	60.6	2.4	26.5	**87.2**	**93.7**	**6.5**
LV369C	647239	7527841	169.3	165.2	96.0	40	43	53.4	55.9	2.6	30.7	86.7	91.4	4.7
LV370C	647289	7527760	**169.0**	165.1	102.0	29	42	58.5	60.9	2.4	26.6	**87.5**	**94.0**	**6.5**
LV371	647175	7527950	**169.5**	165.4	96.0	36	48					76.5	81.8	5.3
LV372	647115	7528050	**169.9**	165.8	96.0	34	54					**78.3**	**81.7**	**3.4**
LV373	647048	7528165	**169.8**	165.8	73.0	35	59					59.2	63.9	4.7
LV374	647021	7528209	**169.9**	165.9	66.0	36	56					51.5	56.1	4.5
LV375	646975	7528123	**169.1**	165.1	78.0	41	45					**40.8**	**41.5**	**0.7**
LV376	647039	7526501	**170.5**	166.5	78.0	20	34	36.4	37.6	1.3	26.4	64.0	68.2	4.2
LV377	646866	7526410	**170.9**	166.9	72.0	22	34					58.1	62.8	4.7
LV410	647280	7526995	**168.5**	164.6	102.0	38	52					83.4	88.0	4.5
LV411	647128	7526997	**168.7**	164.8	72.0	21	29	29.4	30.7	1.3	22.5	53.2	57.2	4.0
LV412	647021	7526998	**169.2**	165.2	72.0	25	32					**30.4**	**34.6**	**4.2**
LV425	646203	7532647	**169.0**	165.6	72.0	43	54					59.9	65.3	5.4
LV525	647025	7526700	**169.7**	165.7	63.0	14	27	**25.4**	**26.7**	**1.3**	25.5	52.2	56.4	4.2
LV526	646973	7526701	**169.6**	165.7	56.0	14	25	**19.1**	**19.5**		26.1	45.6	50.0	4.4
LV527	646920	7526703	**169.4**	165.4	51.0	13	24					39.9	44.2	4.2
LV528	646873	7526704	**169.6**	165.6	50.0	15	27					38.4	42.7	4.3
LV529	647144	7527320	**169.3**	165.4	62.0	18	41					50.4	55.3	4.9
LV530	647046	7527325	**170.8**	166.8	44.0	11	35					**30.4**	**35.1**	**4.7**
LV532	647109	7527760	**169.5**	165.6	62.0	24	47					49.9	54.5	4.5
LV533	647158	7527758	**169.0**	165.1	74.0	23	38					61.2	65.7	4.5
LV534	647015	7528147	**170.1**	166.1	62.0	48	53					**50.0**	**54.6**	**4.6**
LV535C	646956	7526701	**169.7**	165.8	54.0	18	32					43.7	47.9	4.2
LV536	646832	7526706	**170.0**	166.0	50.0	15	21					38.8	43.0	4.3
LV538	647120	7528210	**169.9**	166.1	66.0	42	52					53.6	58.5	4.9
LV555	647032	7526797	**169.4**	165.4	60.0	20	26					47.6	51.7	4.1
LV557C	647095	7527321	**169.8**	165.9	55.0	19	46					45.9	50.1	4.2
LV1200C	647540	7525133	166.5	166.6	108.2	20	53	66.3	67.5	1.2	28.0	95.5	99.7	4.2
LV1201	647389	7525608	167.5	167.8	195.0	22	48	70.4	71.7	1.3	26.3	98.0	103.1	5.1
LV1202	647513	7526009	166.8	166.9	135.0	22	51	92.6	94.0	1.4	28.0	122.0	126.0	4.0
LV1203C	647290	7525999	166.9	167.1	108.0	21	42	70.5	71.8	1.3	25.5	97.3	101.6	4.3
VE1305	647660	7524754	166.1	166.1	280	8	52					66.2	70.3	4.1
VE1316	647779	7525461	166.4	166.4	240.0	9	70	123.4	124.2	0.9	20.9	**145.2**	**151.4**	**6.3**

LV535C	Coal quality hole
CC505	Qld Government (Cairns County) hole
VE1305	Peabody hole
25.4	Weathered intersection
6.5	Anomalous intersection/value

APPENDIX B

Resource Tables from Surfer – Western Block

RESOURCE ESTIMATES - MDL 303											
Seam	**VL O/burden**	**Status**	**Area**	**Thick**	**Volume**	**RD**	**Tonnes**	**Raw Quality % (adb)**			
			km^2	**m (ave)**	**m^3 x 10^6**	**in situ**	**x 10^6**	**Ash**	**VM**	**S**	**P**
Leichhardt	<150	Indicated	0.79	1.94	1.53	1.51	2.3	25.8	19.8	0.99	0.163
	>150	Indicated	1.02	1.91	1.94	1.51	2.9	25.9	20.1	0.59	0.185
Leichhardt	**Total**	**Indicated**	**1.80**	**1.92**	**3.47**	**1.51**	**5.2**	**25.9**	**20.0**	**0.76**	**0.175**
Vermont Lower ex 3D	0-100	Measured	2.86	3.95	11.28	1.41	15.9	16.0	21.3	1.04	0.087
	100-150[1]	Measured	1.50	3.91	5.87	1.40	8.2	15.1	21.2	0.58	0.071
	150-200[2])	Measured	0.56	4.15	2.34	1.44	3.4	19.3	20.4	0.40	0.069
Vermont Lower 3D	<150	Measured	0.76	4.02	3.06	1.38	4.2	12.7	21.6	0.51	0.086
	150-200 NW	Measured	0.69	4.12	2.84	1.39	3.9	13.4	21.4	0.45	0.066
	150-200 SE	Measured	1.78	4.25	7.58	1.37	10.4	11.2	20.9	0.33	0.066
	200-300 NW	Measured	1.00	4.06	4.06	1.39	5.6	13.2	21.3	0.32	0.060
Vermont Lower	**Total**	**Measured**	**9.16**	**4.04**	**37.03**	**1.40**	**51.7**	**14.3**	**21.2**	**0.61**	**0.075**
Vermont Lower 1	0-100	Indicated	0.51	1.48	0.76	1.44	1.1	19.6	19.7	0.56	0.160
	>100	Indicated	0.42	1.74	0.73	1.51	1.1	27.5	19.6	0.59	0.092
Vermont Lower 1	**Total**	**Indicated**	**0.93**	**1.60**	**1.49**	**1.47**	**2.2**	**23.4**	**19.7**	**0.57**	**0.127**
Vemont Lower 2	0-100	Indicated	0.51	2.57	1.32	1.42	1.9	17.3	22.7	0.51	0.016
	>100	Indicated	0.42	2.59	1.08	1.45	1.6	20.5	23.4	0.56	0.013
Vermont Lower 2	**Total**	**Indicated**	**0.93**	**2.58**	**2.40**	**1.43**	**3.4**	**18.7**	**23.0**	**0.53**	**0.014**
Vermont Lower 1/2	**Total**	**Indicated**	**0.93**	**4.18**	**3.88**	**1.45**	**5.6**				
MDL 303	**Total**	**M + Ind**					**63**				
	(1)	Minor area in extreme SE >150m									
	(2)	Minor area in extreme NE >150m									

RESOURCE ESTIMATES - MDL 429 - MEADOWBROOK											
Seam	**Overburden**	**Status**	**Area**	**Thick**	**Volume**	**RD**	**Tonnes**	**Raw Quality % (adb)**			
			km^2	**m (ave)**	**m^3 x 10^6**	**in situ**	**x 10^6**	**Ash**	**VM**	**S**	**P**
Leichhardt Lower ex 3D	<150VL	Indicated	0.64	2.72	1.74	1.43	2.5	17.2	21.2	0.69	0.229
	150VL-200	Indicated	1.92	2.43	4.67	1.45	6.8	19.7	20.9	0.71	0.208
	200-300	Indicated	2.00	3.37	6.73	1.44	9.7	18.8	21.3	0.46	0.225
	>300	Indicated	0.42	3.83	1.59	1.42	2.3	16.3	20.8	0.34	0.176
Leichhardt Lower ex 3D	**Sub-Total**	**Indicated**	**4.98**	**2.96**	**14.74**	**1.44**	**21.2**	**18.6**	**21.1**	**0.55**	**0.215**
Leichhardt Lower 3D	200-300	Measured	3.83	3.02	11.55	1.47	17.0	21.7	20.0	0.34	0.131
	300-400	Measured	7.37	3.64	26.86	1.43	38.5	18.0	20.9	0.32	0.177
	>400	Measured	3.92	4.52	17.72	1.43	25.3	17.5	20.0	0.31	0.159
Leichhardt Lower 3D	**Sub-Total**	**Measured**	**15.12**	**3.71**	**56.13**	**1.44**	**80.7**	**18.6**	**20.4**	**0.32**	**0.162**
Leichhardt Lower	**Total**	**M + Ind**	**20.10**	**3.53**	**70.87**	**1.44**	**101.9**	**18.6**	**20.6**	**0.37**	**0.173**
Vermont Lower ex 3D	0-100	Indicated	0.59	2.71	1.60	1.47	2.4	23.2	20.9	0.49	0.078
	100-150	Indicated	0.60	2.55	1.52	1.48	2.2	23.6	20.8	0.47	0.101
	150-200	Indicated	1.83	2.47	4.52	1.45	6.5	20.4	20.4	0.41	0.094
	200-300[1]	Indicated	2.22	2.47	5.49	1.45	7.9	20.4	20.1	0.35	0.189
Vermont Lower ex 3D	**Sub-Total**	**Indicated**	**5.23**	**2.51**	**13.12**	**1.45**	**19.1**	**21.1**	**20.4**	**0.40**	**0.133**
Vermont Lower 3D	150-200N[2]	Measured	0.28	3.89	1.09	1.43	1.6	18.6	20.5	0.38	0.050
	150-200S[3]	Measured	0.59	4.17	2.47	1.38	3.4	12.2	21.3	0.41	0.099
	200-300[4]	Measured	6.62	4.04	26.74	1.39	37.2	14.0	20.7	0.31	0.070
	300-400[2]	Measured	9.00	3.86	34.77	1.39	48.5	14.3	19.9	0.30	0.095
	>400	Measured	5.60	4.26	23.86	1.39	33.3	14.3	19.3	0.29	0.079
Vermont Lower 3D	**Sub-Total**	**Measured**	**22.09**	**4.03**	**88.93**	**1.39**	**124.0**	**14.2**	**20.0**	**0.31**	**0.083**
Vermont Lower	**Total**	**M + Ind**	**27.32**	**3.73**	**102.05**	**1.40**	**143.1**	**15.1**	**20.1**	**0.32**	**0.089**
Vermont Lower 1	0-100	Indicated	0.46	1.25	0.58	1.43	0.8	17.9	20.0	0.56	0.175
	>100	Indicated	0.55	1.37	0.75	1.47	1.1	22.5	19.9	0.58	0.127
Vermont Lower 1	**Total**	**Indicated**	**1.01**	**1.32**	**1.33**	**1.45**	**1.9**	**20.5**	**20.0**	**0.57**	**0.148**
Vermont Lower 2	0-100	Indicated	0.46	1.43	0.67	1.44	1.0	19.3	19.6	0.49	0.008
	>100	Indicated	0.55	1.58	0.86	1.46	1.3	20.8	20.9	0.54	0.008
Vermont Lower 2	**Total**	**Indicated**	**1.01**	**1.51**	**1.53**	**1.45**	**2.2**	**20.1**	**20.3**	**0.52**	**0.008**
			1.01	**2.83**	**2.86**	**1.45**	**4.1**	**20.3**	**20.2**	**0.54**	**0.073**
MDL 429 Meadowbroo	**Total**	**M + Ind**					**249**				
	(1)	Minor area >300 in NE									
	(2)	Extends slightly outside 3D area									
	(3)	Minor area <150m in SW									
	(4)	Minor area <200m in SE									

RESOURCE ESTIMATES - 3D SEISMIC											
Seam	**Overburden**	**Status**	**Area**	**Thick**	**Volume**	**RD**	**Tonnes**	**Raw Quality % (adb)**			
			km^2	**m (ave)**	**m^3 x 10^6**	**in situ**	**x 10^6**	**Ash**	**VM**	**S**	**P**
Leichhardt Lower	200-300	Measured	3.83	3.02	11.55	1.47	17.0	21.7	20.0	0.34	0.131
	300-400	Measured	7.37	3.64	26.86	1.43	38.5	18.0	20.9	0.32	0.177
	>400	Measured	3.92	4.52	17.72	1.43	25.3	17.5	20.0	0.31	0.159
Leichhardt Lower	**Total**	**Measured**	**15.12**	**3.71**	**56.13**	**1.44**	**80.7**	**18.6**	**20.4**	**0.32**	**0.162**
Vermont Lower 429	150-200N	Measured	0.28	3.89	1.09	1.43	1.6	18.6	20.5	0.38	0.050
	150-200S	Measured	0.59	4.17	2.47	1.38	3.4	12.2	21.3	0.41	0.099
	200-300[4]	Measured	6.62	4.04	26.74	1.39	37.2	14.0	20.7	0.31	0.070
	300-400[2]	Measured	9.00	3.86	34.77	1.39	48.5	14.3	19.9	0.30	0.095
	>400	Measured	5.60	4.26	23.86	1.39	33.3	14.3	19.3	0.29	0.079
Vermont Lower 429	**Sub-Total**	**Measured**	**22.09**	**4.03**	**88.93**	**1.39**	**124.0**	**14.2**	**20.0**	**0.31**	**0.083**
Vermont Lower 303	<150	Measured	0.76	4.02	3.06	1.38	4.2	12.7	21.6	0.51	0.086
	150-200 NW	Measured	0.69	4.12	2.84	1.39	3.9	13.4	21.4	0.45	0.066
	150-200 SE	Measured	1.78	4.25	7.58	1.37	10.4	11.2	20.9	0.33	0.066
	200-300 NW	Measured	1.00	4.06	4.06	1.39	5.6	13.2	21.3	0.32	0.060
Vermont Lower 303	**Sub-Total**	**Measured**	**4.23**	**4.14**	**17.55**	**1.38**	**24.2**	**12.3**	**21.2**	**0.37**	**0.068**
Vermont Lower	**Total**	**Measured**	**26.33**	**4.04**	**106.48**	**1.39**	**148.2**	**13.9**	**20.2**	**0.32**	**0.080**
3D Seismic	**Total**						**229**				

APPENDIX C

JORC Table 1

JORC TABLE 1

Criteria	Explanation
Section 1: Sampling Techniques and Data	
Sampling techniques	Coal quality samples taken from HQ (61mm) or 100mm cores.
	100mm cores and some 61mm cores sampled with reference to geophysical log from adjacent pilot hole
Drilling techniques	Quality samples taken using triple tube core barrels with diamond (61mm) or PCD (100mm) coring bits
Drill sample recovery	Linear sample recovery >90% in coal mandatory; or re-drill ordered unless ground considered too highly structured
Logging	Cores measured immediately on removal from core barrel to verify recovery
	All coal core marked up with depths and photographed prior to logging for future reference
	Coal cores logged in field for brightness and partings by competent geologist
	Core depths subsequently adjusted for geophysics and seam thicknesses verified against geophysics
Sub-sampling techniques and	All coal core sampled
sample preparation	Only core samples sent for analysis and testing used for estimation of quality
	Samples sent to a NATA registered laboratory and tested according to Australian Standard procedures
	On receipt at laboratory, samples checked against sample sheet sent from field
	As required, samples rotary sub-divided after drop shatter and hand knapping to maximise representivity
Quality of assay data and	Samples sent to a NATA registered laboratory and tested according to Australian Standards
laboratory tests	
Verification of sampling and	Sample intervals verified by down hole geophysics
assaying	Data received from laboratory checked by coal quality expert and any suspect results triggered check testing
Location of data points	All holes accurately surveyed in the AMG system by real time differential GPS
	Z co-ordinate accurate to within 10cm. Because of variation in RLs from historical survey data all RLs adjusted to DTM
Data spacing and distribution	Geophysically logged hole spacing for Measured Resources <600m with quality data points maximum 800m apart. Hole spacing
	relaxed in 3D seismic areas where coal quality was extremely consistent.
	Geophysically logged hole spacing for Indicated Resources 1000m with quality data points maximum 1200m apart
Orientation of data in relation	Major structures at Lake Vermont oriented NNW. Drill traverses oriented ENE to intersect structures
to geological structure	Coal seams tabular deposits aligned at low angle to horizontal. Vertical drill holes appropriate to minimise any
	exaggeration of seam thickness
	From 2010 to 2014 holes >110m deep logged for verticality to ensure no thickness bias introduced by borehole deviation
	From 2015 forward all holes >80m deep logged for verticality
Sample security	Samples double bagged. Each bag labelled with sample tags inserted between bag layers
	Sample from field checked against samples received at NATA registered laboratory
	Once samples receipted they are allocated a discrete laboratory number for testing and analysis
Audits or reviews	Data for resource statement reviewed and adjusted where necessary (mainly seam correlations) prior to 2012
	exploration program
	Borehole data from 2012, 2015/2016 and 2020/2021 exploration programs adjusted for geophysics by Senior Geologist,
	then subjected to final check by Program Manager (also Competent Person)
	Coal quality data checked at lab. before being distributed; and then double checked by Minserve coal quality expert
Section 2: Reporting of Exploration Results	
Mineral tenement and land	MDL 303 and MDL 429 checked for ownership, currency and good standing on Dept of Natural Resources and
tenure status	Mines (DNRM) MinesOnline database
	Bowen Basin Coal Pty Ltd confirmed as Authorised Holder of MDLs
	MDL 303 and MDL 429 temnements extended to 2027 in 2022.
	All statutory reports and expenditure statements up to date.
	Meadowbrook is the northern and northeastern extension of an existing mining operation in ML 70331 - Lake Vermont Mine
	and a planned extension into ML 70528, which abuts the southern boundary of Meadowbrook
	Surface rights to land covering ML 70528 and Meadowbrook have been finalised
Exploration done by other	Acknowledged in section 5 of resource statement
parties	Early exploration undertaken by Government. Some borehole data obtained from Arrow via data sharing agreement
	Data from holes adjacent to Meadowbrook obtained via a data sharing agreement with Peabody
Drill hole information	See sections 5 and 6 of resource statement and Appendix A1 and Appendix A2
Data aggregation methods	Ply coal quality aggregated for full seam quality by ply length and RD.
Relationship between	Coal resources are near horizontal, tabular deposits intersected by vertical drill holes
mineralisation widths and	True thickness of seams obtained from drill hole intercept
intercept lengths	

JORC TABLE 1

Criteria	Explanation
Diagrams	Figures 1 to 37 of resource statement. Most Figures at 1:40,000 and A3 size
Balanced Reporting	All data reported
	Holes excluded from resource estimation if not geophysically logged.
Other substantive exploration	3D seismic survey over whole underground footprint. >484k 2-way travel time records converted to depths to top of VL
data	and >387k 2-way travel time records converted to depths to top of LHL
	3D seismic indicated throw and orientation of structures in proposed underground
Further work	Re-processing and re-interpretation of 3D seismic in deeper areas where fault throws may be overstated by up to 30%
	Additional gas holes and ground truthing of faults by drilling
Section 3: Estimation and Reporting of Mineral Resources	
Database integrity	Data from field adjusted for geophysics and updated on an external hard drive only accessed by two very
	senior geologists
	Any change made to data on external hard drive by one geologist communicated immediately to the other via
	email for checking and verification
Site visits	Competent person also the person responsible for planning and managing exploration over past 20 years.
	Site visits conducted pre, during and post exploration
Geological interpretation	High confidence in the geological interpretation based on drill holes supported by seismic surveys
	Data used only from geophysically logged drill holes with seam intercepts adjusted for geophysics
	Data do not support alternative geological interpretations
	Resource estimate fully reliant on geology and seismic
	Continuity demonstrated in drill hole data and from seismic surveys
	Intensity and size of faults identified from seismic used to limit extent of resources
Dimensions	Extent and variability fully covered in sections 6, 7 and 8 of resource statement
	Resources limited to the west by seam crops, to the east in the Western Block by structure, to the north (Western Block) and
	east (Central Block) by Meadowbrook ; and to the south by northern boundary of ML 70528
Estimation and modelling	Deposit modelled using Surfer 9 (Central Block) and Surfer 21 (Western Block) and subsequently by Maptek Vulcan 3D V 2022.1
techniques	as an audit/check
	10m x 10m grid size (Surfer); Initial 10m x 10m grid sie in Vulcan, subsequently cut at 25m
	Gridding methods used in Surfer were Kriging and Minimum Curvature (overburden contours only)
	Gridding methods used in Vulcan were Triangulation (structure) and Inverse Distance (quality)
	There were no extreme data points
	Extrapolation not necessary because data extended beyond limits of resources
	No by-products relevant for coal resource
	Sulphur and phosphorous modelled and discussed in detail in section 7 of resource statement
	How geological interpretation used to control resource estimates discussed in detail in section 8 of resource
	statement
Moisture	Resource tonnages (Western Block) estimated on 5% in situ moisture basis
	In situ moisture content derived from extensive MHC tests carried out on coal samples from Lake Vermont
Cut-off parameters	50% ash cut-off for coal
	Seam split if parting >50% ash exceeds 20cm thickness
Mining factors or assumptions	All Measured and Indicated Resources technically (but not necessarily economically) mineable by open cut and longwall
Metallurgical factors or	Core testing based on a nominal 7.5% ash coking coal primary product, nominal 10% ash PCI coal secondary product and a
assumptions	nominal 20% ash energy coal tertiary product
Environmental factors or	Not considered in resource statement, since resource area an extension of an existing mining operation
assumptions	EIS submitted in support of ML application over the resources in Meadowbrook
Bulk density	Resources in Western Block estimated from in situ RD, using the Preston-Sanders formula and in situ moisture of 5%
Classification	Discussed in detail in section 8.1 and 8.5 of resource statement
Audits or reviews	Resources initially estimated in Surfer then by external consultant using Vulcan software. Vulcan resources used as official
	estimate. Total difference between two estimates less than 3%.
Discussion of relative	See section 8.1 and 8.5 of resource statement
accuracy/confidence	