Ref: ADV-SY-03728

4th May 2011

The Directors
Glencore International plc (the "Company")
Queensway House, Hilgrove Street
St Helier Jersey JE1 1ES

Dear Sirs,

COMPETENT PERSON'S REPORT – GLENCORE COLOMBIAN COAL ASSETS

This Competent Person's Report ("*CPR*") has been prepared jointly by Minarco-MineConsult ("*MMC*") and McElroy Bryan Geological Services ("*MBGS*") at the request of Glencore International AG ("*Glencore*"). The scope is to undertake an independent technical review and valuation of the relevant geological, mining and infrastructure assets of Glencore in Colombia; including specifically CI Prodeco SA ("*Prodeco*"), the Calenturitas Coal Mine ("*Calenturitas*") and the La Jagua Coal Mine ("*La Jagua*"). The combined MMC and MBGS technical review team is referred to in this report as "*MMC/MBGS*". It is understood that Glencore will include this report in a prospectus to be published in connection with the Initial Public Offering ("*IPO*") of Glencore International plc on the London Stock Exchange and the Hong Kong Stock Exchange. Glencore International plc is expected to be the parent company of the group.

The purpose of the report is to provide a technical opinion as to the accuracy and reasonableness of the information supporting the assets. The focus of the review is on the technical aspects of the assets; including geology, Resources and Reserve Statements, mine plans, production rates, infrastructure, environment and capital and operating costs estimates.

This report, which summarises the findings of our review, has been prepared in order to satisfy the requirements of the "Prospectus Rules" published by the UK Financial Services Authority from time to time and governed by the UK Listing Authority, the "Prospectus Directive" (2003/71/EC) and the Prospectus Regulations (809/2004), "CESR's (now the European Securities and Markets Authority) recommendations for the consistent implementation of the European Commissions Regulation on Prospectuses No. 809/2004" (as updated by the European Securities and Market Authority on 23 March 2011 following the publication of a consultation paper in April 2010 in relation to the content of prospectuses regarding mineral companies) and Chapter 18 of the Hong Kong Listing Rules. The CPR has been conducted in recognition of the requirements of the "Australian Code for Reporting of exploration Results, Mineral Resources and Ore Reserves" (December 2004) published by the Joint Ore Reserves Committee ("JORC") of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and the Minerals Council of Australia (the "JORC Code"). The JORC Code establishes the nature of evidence required to ensure compliance with the JORC Code. The review was conducted with regard to the JORC Code because it is internationally recognised. In this report, all resource and reserve estimates are reported in accordance with the JORC Code and have been substantiated by evidence obtained from our site visits and observation and are supported by details of drilling results, analyses and other evidence and takes account of all relevant information supplied to us by company management and the directors of Glencore.

MMC/MBGS has made no independent review to determine whether Glencore holds any other key Colombian assets. Other global assets of Glencore have not been valued as part of this report.

Glencore, through its wholly owned subsidiary Prodeco, owns and operates two open cut coal mines in Colombia; the Calenturitas and the La Jagua coal mines. The mines are located in an active mining region of the Department of Cesar, Colombia, approximately 100 km south of the city of Valledupar. The Puerto Prodeco is located some 220 km to the north of the project site on Colombia's Caribbean coast near the city of Santa Marta, as shown in **Figure 1**. The two mines are separated by approximately 20 km. Prodeco holds exploration and mining title over both coal deposits.

The Calenturitas mine has **400 Mt** of Resources, **209** Mt of Reserves and for 2011 is budgeted to produce 8.5 Mtpa with plans to expand to approximately 14 Mtpa by 2015 with a life of mine to 2029.

The La Jagua mine has **140 Mt** of Resources, **128 Mt** of Reserves and for 2011 is budgeted to produce 7.1 Mtpa with a life of mine to 2029.

MMC/MBGS has reviewed each of the Prodeco assets and has undertaken a valuation of the operating assets included in Prodeco's cash flow forecasts. MMC/MBGS concludes from this review:

- no material flaws, errors or omissions on the technical aspects of the Project were discovered during the review;
- the technical information reviewed is considered reasonable and has been prepared by professionals using appropriate software and industry standards;
- the geological and geotechnical understanding is of a sufficient level to support short, medium and long-term planning as appropriate;

- the mine plans appropriately reflect known geological and geotechnical understanding and account for predicted mining hazards;
- Prodeco's mining equipment (either in place or planned in the capital forecasts) is suited to its mine plans and supports the production levels forecast;
- the assumptions used in estimating coal and waste production volumes, working room, mining losses and dilutions are appropriate and reasonable;
- coal handling and other infrastructure including rail and port are capable of producing and supplying appropriate coal quality products to satisfy the export markets at the forecast volumes;
- identified environmental issues are being well managed and there are no apparent issues that could impede production nor are any prosecutions pending;
- the assumptions used in estimating operating costs are appropriate and reasonable, covering the spectrum of mining, processing, coal transport, and site administration associated in getting the coal to the point of sale;
- capital costs used in the financial models reflect the mine plans, development and construction schedules and the forecast production levels;
- key risks identified by MMC/MBGS are understood by management and appropriate action to mitigate these risks has been taken. Further, the mine plans and cost forecasts appropriately account for these risks; and
- the drivers of the production and cost forecasts are understood by management and are receiving the management focus required.

MMC/MBGS is of the opinion that the Colombian coal assets of Prodeco:

- represent a significant component of the Colombian coal industry;
- have mine plans over areas of Measured and Indicated Resources which generate forward schedules for more than 19 years;
- have a total value (at 10% discount factor) of Proved and Probable Reserves of approximately USD 4,885 million with 75% of this value associated with Proved Reserves (based on a valuation date 01/01/2011); and
- have value that is most sensitive to changes in coal price with a 15% reduction in coal price decreasing reserve value by over 32 % to USD 3,298 million.

MMC and MBGS have both been commissioned to jointly prepare this CPR and this CPR was undertaken on behalf of MMC and MBGS by the signatories of this report.

The first signatory to this CPR, Mr. Grant Walker, BE (Mining) MAusIMM, is a member of the Australasian Institute of Mining and Metallurgy, and is an employee of MMC. He has over 15 years experience in the mining industry with significant experience in technical reviews, audits, due diligence assessments and valuation of mining assets. He has sufficient experience which is relevant to the style of mineralisation and types of coal deposits under consideration, and to the activity he is undertaking outcome of this CPR, to qualify him as a Competent Person (as defined in the 2004 Edition of the JORC Code).

The second signatory to this letter, Mr. Kerry Whitby, FAusIMM, is a Fellow of the Australasian Institute of Mining and Metallurgy, and is the Managing Director of McElroy Bryan Geological Services. He has 39 years experience in the mining industry and has sufficient experience which is relevant to the style of mineralisation and types of coal deposits under consideration, and to the activity he is undertaking in relation to this CPR, to qualify him as a Competent Person (as defined in the 2004 Edition of the JORC Code).

Yours sincerely,

Grant Walker
Consulting Mining Engineer
Minarco-MineConsult

Kerry Whitby
Managing Director
McElroy Bryan Geological Services

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1. INTRODUCTION

1.1 Purpose of Report

This Competent Person's Report ("*CPR*") has been prepared jointly by Minarco-MineConsult ("*MMC*") and McElroy Bryan Geological Services ("*MBGS*") at the request of Glencore International AG ("*Glencore*"). The scope was to undertake an independent technical review and valuation of the relevant geological, mining and infrastructure assets of Glencore in Colombia; including specifically CI Prodeco SA ("*Prodeco*"), the Calenturitas Coal Mine ("*Calenturitas*") and the La Jagua Coal Mine ("*La Jagua*") (together the "Assets"). The combined MMC and MBGS technical review team is referred to in this report as "*MMC/MBGS*". It is understood that Glencore will include this report in a prospectus to be published in connection with the Initial Public Offering ("*IPO*") of Glencore International plc on the London Stock Exchange and Hong Kong Stock Exchange. Glencore International plc is expected to be the ultimate parent company of the group.

The purpose of the report is to provide a technical opinion as to the accuracy and reasonableness of the information supporting the assets. The focus of the review is on the technical aspects of the assets; including geology, resources and reserve estimates, mine plans, production rates, infrastructure, environment and capital and operating costs estimates.

This report, which summarises the findings of our review, has been prepared in order to satisfy the requirements of the "Prospectus Rules" published by the UK Financial Services Authority from time to time and governed by the UK Listing Authority, the "Prospectus Directive" (2003/71/EC) and the Prospectus Regulations (809/2004), "CESR's (now the European Securities and Markets Authority "ESMA") recommendations for the consistent implementation of the European Commissions Regulation on Prospectuses No. 809/2004" (as updated by the European Securities and Market Authority on 23 March 2011 following the publication of a consultation paper in April 2010 in relation to the content of prospectuses regarding mineral companies) and Chapter 18 of the Hong Kong Listing Rules. With respect to resources and reserves the CPR has been conducted in recoginition of the "Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (December 2004) published by the Joint Ore Reserves Committee ("JORC") of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and the Minerals Council of Australia (the "JORC Code"). The JORC Code establishes the nature of evidence required to ensure compliance with the JORC Code. The review was conducted with regard to the JORC Code because it is internationally recognised. In this report, all resource and reserve estimates are reported in accordance with the JORC Code and have been substantiated by evidence obtained from our site visits and observation and are supported by details of drilling results, analyses and other evidence and takes account of all relevant information supplied to us by company management and the directors of Glencore.

Also, the CPR recognises the *Code for The Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Report, The VALMIN Code, 2005 Edition*, prepared by the VALMIN Committee, a joint committee of the Australasian Institute of Mining and Metallurgy.

MMC has made no independent review to determine whether Glencore holds any other key Colombian assets and other global assets of Glencore have not been valued as part of this report.

1.2 Scope of Work

MMC/MBGS carried out the following scope of work:

- Introductory meetings with Glencore's management and consultants to fully understand the business plan.
- Site visits and collection of data.
- Review and assessment of technical aspects of the Assets. The key elements of review included:
    - suitability of existing information supporting the Life of Mine and Business Plans;
    - geology reports and models;
    - resource and reserve estimates;
    - mining operations and proposed expansions;
    - coal preparation and handling;
    - coal transportation;
    - port operations;
    - environmental approvals and matters;
    - estimated capital and operating costs
    - identification of key project drivers and issues; and
    - valuation of Reserves.

- Preparation of this CPR in a format commensurate with the recommendations and guidelines of the UKLA, European Securities and Market Authority and the listing rules.

In accordance with ESMA Recommendations and the Prospectus Rules, only Proved and Probable Reserves have been valued.

1.3 Capability and Independence

This CPR was undertaken on behalf of MMC and MBGS by the signatories to this report, details of whose qualifications and experience are set out in **Annex A**. MMC and MBGS both operate as independent technical consultants providing resource evaluation, mining engineering and mine valuation services to the resources and financial services industry.

MMC and MBGS have both been commissioned as technical consultants to Prodeco for Calenturitas and La Jagua for a number of years and previously have produced JORC Code compliant Resources and Reserves Statements as well as Life of Mine ("*LOM*") plans for Prodeco. MMC/MBGS has also carried out assignments for potential investors for other nearby coal projects in the last three years. MMC/MBGS has considered the matter of potential conflict of interest concerning former work and former reviews and have concluded that they would not be conflicted in preparing this CPR, on the basis that it is being prepared as an independent report and their fees are not dependent on the outcome of the report.

None of MMC/MBGS or MMC/MBGS's staff or specialists who contributed to this report has any interest or entitlement, direct or indirect, in Glencore, Glencore International plc, Calenturitas, La Jagua or the outcome of this technical review in the contents of this CPR.

For the purposes of Prospectus Rule 5.5.3R(2) MMC and MBGS are responsible for this report as part of the Prospectus and declare that they have each taken all reasonable care to ensure that the information contained in this report is, to the best of their knowledge, in accordance with the facts and contains no omission likely to affect its import. This declaration is included in the Prospectus in compliance with item 1.2 of Annex I and item 1.2 of Annex III of the Prospectus Directive Regulation.

Drafts of this CPR report were provided to Prodeco and Glencore for review as to any material errors of fact, omissions or incorrect or unreasonable assumptions.

All opinions, findings and conclusions expressed in this CPR are those of MMC/MBGS (as relevant) except to the extent that such opinions, findings or conclusions are based upon, either in whole or in part, on information provided by Prodeco, Glencore or any 3rd parties.

1.4 Methodology

The reasonableness of the geological data and the technical assumptions used in Glencore's mine plans and financial models were the prime focus of this review.

The following points cover the main areas that the review focussed on and a brief description of the methodology used:

- Resources and Reserves: The JORC Code reports were reviewed for compliance and then the JORC Code totals were cross referenced to the sales tonnes in the business model;
- Mine Plans: Production assumptions, mining rate and production schedules were reviewed and matched against the Mine Plan model inputs;
- Capital and Operating Costs: The key inputs were cross referenced to an in-house MMC cost database for reasonableness; and
- Key Project Issues: Important issues which may have a material impact on the outcomes presented in the Mine Plan were identified during the review.

1.5 Technical Review Team

MMC and MBGS were joint project managers for this Independent Technical Review. A Technical Review Team (the "Team") was assembled including:

- Minarco-MineConsult ("MMC") – Joint project management, review of mining and coal reserves, and valuation of assets;
- McElroy Bryan Geology Services ("MBGS") – Joint project management, review of geology and coal resources, and coal quality;
- Bob Leach Pty Ltd ("B Leach") - Review of coal quality;
- Hansen Bailey Pty Ltd ("Hansen Bailey") – Review of environmental approvals and matters; and
- Inteplan Pty Limited – Review of infrastructure, including coal transport and Port.

We understand from discussions with Glencore that in parallel to these technical reviews, Glencore has commissioned reviews of the corporate, legal and marketing aspects of Prodeco. These reviews and their subject matter are not included in this CPR.

Qualifications of the team are listed in Annex A.

1.6 Site Inspection

In general, as part of ongoing technical consultants work for Prodeco, MMC, MBGS, B Leach and Inteplan have all visited the sites on numerous occasions and both signatories to this CPR have visited the mines on many occassions. More recently, for the specific purpose of this CPR, Inteplan and Hansen Bailey visited the sites in November 2010. MMC/MBGS believes the Technical Review Team is suitably familiar with the sites to act as Competent Persons.

1.7 Limitations and Exclusions

This CPR specifically excludes all aspects of legal issues, land titles and agreements, except such aspects as may directly influence technical, operational or cost issues. MMC/MBGS has not undertaken an evaluation of marketing or coal pricing forecasts. This CPR does not consider financial or commercial matters, including without limitation loan funding aspects, profit and loss, balance sheet, non-cash items, commodity prices, or exchange rates. MMC/MBGS reserves the right to change its view of any of the conclusions set out in this CPR should any of the fundamental information provided to MMC/MBGS materially change.

1.8 Materiality

MMC has adopted the Australian Accounting Standards Board AASB 1031 which proposes that the materiality of information or data can be assessed in terms of the extent to which its omission or inclusion could lead to changes in total value:

- equal to or less than five percent – immaterial;
- between five and ten percent – discretionary; and
- equal to or greater than ten percent – material.

These guidelines were used as a general guide. MMC/MBGS has not in all cases been able to determine the value impact of an issue when determining the materiality of an item.

1.9 Information Sources

The contents of this CPR have been created using data and information provided by or on behalf of Glencore. In MMC/MBGS's opinion, the information provided was reasonable and nothing discovered during the review suggested that there was any material error or misrepresentation in respect of that information. Information generated by third parties, consultants or contractors to Glencore has not been independently validated by MMC through the generation of new work or new data.

MMC accepts no liability for the accuracy or completeness of data and information provided to it by, or obtained by it from Glencore or any third parties, even if that data and information has been incorporated into or relied upon in creating this report. The report has been produced by MMC using information that has been provided to MMC as at the date stated on the cover page. MMC is under no obligation to update the information contained in the report at any time after the date shown on the cover page, though MMC reserves the right to change its view of any of the conclusions set out in this CPR should any of the fundamental information provided to MMC materially change.

1.10 Information About This Document

This CPR must be read in its entirety and must be read in light of the following.

- Its reliance upon information provided to MMC/MBGS by Prodeco, Glencore and others;
- The methodology and limitations and assumptions referred to throughout the report;
- The limited scope of the report; and
- Other relevant issues not within the scope of the report.

Save as provided under PR5.5.3(2) and to the fullest extent permitted under law, use of or reliance on this report by any third parties is at their sole risk and MMC/MBGS will not be liable for any liability, loss or damage suffered by a third party relying on this report regardless of the cause of action, whether breach of contract, tort (including negligence) or otherwise.

MMC/MBGS makes no warranty, express or implied in respect of this CPR, particularly with regard to any commercial investment decision made on the basis of this CPR. This CPR has been prepared without taking into account the objectives, financial situation or needs of any individual, entity or organization.

This document speaks only as of the date of the report and MMC/MBGS has no duty to update it.

1.11 Glossary of Terms

A glossary of terms is listed in Annex B.

1.12 Currency

All currency is United States dollars unless otherwise indicated.

1.13 Inherent Mining Risks

Coal mining is carried out in an environment where not all events are predictable.

Whilst an effective management team can identify the known risks and take measures to manage and mitigate those risks, there is still the possibility for unexpected and unpredictable events to occur. It is not possible therefore to totally remove all risks or state with certainty that an event that may have a material impact on the operation of a coal mine, will not occur.

It is therefore not possible to state with certainty, forward looking production and economic targets, as they are dependent on numerous factors that are beyond the control of MMC/MBCS and cannot be fully anticipated by MMC/MBGS. These factors include but are not limited to, site specific mining and geological conditions, the capabilities of management and employees, availability of funding to properly operate and capitalise the operation, variations in cost elements and market conditions, developing and operating the mine in an efficient manner. Unforeseen changes in legislation and new industry developments could also substantially alter the performance of any mining operation.

2. PRODECO OVERVIEW

MMC/MBGS is satisfied that Glencore management has established a capable management team at each operating asset. MMC/MBGS found that management understands the key drivers and risks at each of the coal mines and has developed credible mine operation plans that address these drivers and risks. Although projected results are subject to variances in accuracy and to risks typically associated with mining, the life of mine plans are based on sound resources, sound technology, supportable production levels, and adequate infrastructure. MMC/MBGS found nothing during the preparation of this CPR which would have a material impact (as defined in Section 1.8) upon the LOM forecast production or capital or operating costs of the assets.

2.1 Description of Assets

Glencore, through its wholly owned subsidiary Prodeco, owns and operates two open cut coal mines in Colombia; the Calenturitas and the La Jagua coal mines. The mines are located in an active mining region of the Department of Cesar, Colombia, approximately 100 km south of the city of Valledupar. The Puerto Prodeco is located some 220 km to the northwest of the project site on Colombia's Caribbean coast as shown in **Figure 1**. The two mines are separated by approximately 20 km. Prodeco holds exploration and mining title over both coal deposits.

The Calenturitas mine is currently producing at approximately 8.5 Mtpa with plans to expand to approximately 14 Mtpa by 2015 with a life of mine to 2031. The La Jagua mine is currently producing at approximately 7 Mtpa with a life of mine to 2029.

The mining method is open cut mining. This is based on multi-seam, steep dip, truck and shovel open cut coal mining initially in strips to ex-pit dumps with a progression over time to haulback waste dumping in-pit. Small scale underground mining was undertaken at La Jagua but is no longer operating. Trials of highwall entry methods, such as auger mining, have been conducted at Calenturitas. The auger mining trial has been successfully completed and approximately 200kt of coal has been produced. This exercise has shown good roof stability in the auger holes, confirmed seam consistency and manageable methane gas levels were encountered giving early confidence for future plans to extract additional coal not included in this valuation.

Infrastructure exists at each deposit and consists of a mine camp and facilities, workshops, offices and coal handling facilities. A rail spur was completed in 2008 to replace the previous system of hauling the coal to the coast at Santa Marta by road trucks. Coal from the nearby La Jagua mine is hauled by road trucks to Calenturitas where it is blended and train loaded out to Puerto Prodeco. The mined coal is crushed and shipped to market without any additional washing/processing.

Prodeco owns and operates its own rail haulage and port facilities. The rail line concession is held by Fenoco in which Prodeco holds a 39.76% share.

Most coal is currently sold to the international market as a thermal coal with approximately 0.5 Mt to 1.5 Mt of La Jagua coal sold as high volatile Pulverized Coal Injection ("PCI"). The coal has a track record with recognition in the market and its energy and relatively low sulphur content makes it attractive in the market place. Some of the quality characteristics of the La Jagua coal have allowed sales into the high volatile PCI metallurgical coal markets. The coal is marketed by Glencore, the owner of Prodeco.

The general locations of Prodeco's assets are shown in **Figure 1** and the more specific locations within the relevant coalfields for the various assets are shown in **Figure 2**

A more detailed description of the assets is provided in **Section 3** and **4.**

2.2 Summary of Geology

The coal deposits are part of Tertiary coal bearing sediments preserved in the Cesar-Rancheria basin. The basin is limited tectonically by the Oca Fault in the north and the Bucaramanga-Santa Marta Fault in the south and west. Two other structural features control the basin limits, an igneous and metamorphic complex to the northwest (Sierra Nevada de Santamarta) and the Perija Hills to the east which comprises Jurassic and Cretaceous sediments. These hills are an extension of the eastern Andean Mountains of Colombia (Cordillera Oriental).

The basin is subdivided into the Rancheria Basin in the north where the Cerrejon Mine is located and the Cesar Basin in the south with the Calenturitas and La Jagua deposits. Continuity of the coal measures between the two sub-basins has not been demonstrated.

The Calenturitas deposit is part of a regional synclinal structure (La Loma Syncline) and subsequent NE trending thrust faulting has resulted in the current distribution of numerous coal deposits in that area. Those deposits are now the focus of a number of open cut operations such as Pribbenow and El Descanso (Drummond), La Francia (Goldman Sachs) and El Hatillo (Vale). The tectonic setting is predominantly compressive with NE-trending thrust faults the main structural features. Extensive 2D seismic surveys in the Cesar Basin over the last 30 years have clearly indicated the structural control governing the distribution of the coal measure strata.

The La Jagua coal deposit is a synclinal basin formation approximately 5 km long and 2 km wide. The deposit is multi seamed and steeply dipping on both the north-west and south-east flanks. The centre of the deposit is much flatter with dips up to 5°. On the basis of borehole and mining records to date, faulting is not common and no major structures have been identified.

Both deposits are characterised with multiple dipping seams of variable thickness and quality. **Figure 4** and **Figure 9** show cross sections of the coal deposits.

2.3 Summary of Resources and Reserves

MMC/MBGS is of the opinion that Glencore understands the geology of the coal resource of each asset. This has enabled technical, operational and marketing personnel to identify opportunities particular to each asset and to implement strategies that maximise resource development within the framework of the total business.

Glencore has standardised the collection and treatment of geological, geotechnical and coal quality data for each asset. Each coal mine has a comprehensive geological and resource assessment team and computerised database and geological model accessible to technical staff.

Glencore's focus on understanding the geology of each asset is evident in the relatively high proportion (87%) of the total coal resources which are classified as Measured and Indicated Resources. Consequently, Glencore can exploit a large Coal Reserve base and integrate long term planning options between the various assets with a reasonable level of confidence.

Coal resources for each mine area were estimated after assessment of the quality, quantity and distribution of geoscientific points of observations and knowledge available for that site. The exploration data was in all cases collected from a variety of sources over the life of each project. Points of observation such as cored and non-cored drill holes, outcrops, geological mapping of open cut pits and previous underground mine workings and geophysical data provided a level of confidence of seam continuity throughout each resource block.

Additional information such as lithological and geotechnical logging of core samples, coal quality analyses from core samples and mine strip samples, downhole geophysical logging and sonic acoustic scanners were used to establish evidence of coal quality continuity and structural disturbance of the coal-bearing strata. Detailed validation of data stored in geological databases was carried out and checked for integrity against raw data, especially in relation to seam thickness and relative density. The process used to create geological computer models was critically reviewed and validated.

Resources were classified as Measured, Indicated and Inferred according to the level of confidence in the geological interpretation and were estimated within discrete resource blocks, on the basis of resource classification, geological and surficial limits. In general, Measured Resources were supported by data points of observation close enough (generally less than 500 m apart) to support a high level of confidence in the geological and/or grade continuity. Indicated Resources were supported by points of observation generally less than 1 kilometre apart and Inferred Resources, characterised by a lower level of confidence in seam continuity and quality, were typically supported by data points more than 1 kilometre apart.

JORC Code compliant Resources Statements were prepared for the assets as of 31st December 2010. The Reserves estimates for both assets were updated to the same date.

Proved and Probable Reserves are based on Measured and Indicated Resources and were estimated for each coal mine for which the appropriate level of planning has been carried out. Coal from each mine is not washed and hence no metallurgical factors were applied.

MMC/MBGS found that Glencore has developed mine layouts over areas of Measured and Indicated Resources, which generate forward schedules in the range of +20 years. This has been achieved by completing mining options studies and economic sensitivity analysis which optimise value whilst minimising mining risks.

The current Resources and Reserves estimates are summarised in **Table 2.1** following.

Table 2.1 – Summary of Resources and Reserves (as of 31st December 2010)

Mine Project	Measured Resources (Mt)	Indicated Resources (Mt)	Inferred Resources (Mt)	Total Resources (Mt)	Proved Reserves (Mt)	Probable Reserves (Mt)	Total Opencut Coal Reserves (Mt)
Calenturitas	170	160	70	400	113	96	209
La Jagua	117	23	-	140	106	22	128
Total	**287**	**183**	**70**	**540**	**219**	**118**	**337**

Note: Reserves are a subset of Resources and are included in the Resources estimate.

2.4 Mines and Projects

2.4.1 Mining Methods and Equipment

MMC/MBGS inspected operations at each coal mine. MMC/MBGS observed that each coal mine operator uses well maintained, modern mining equipment and technology and mining methods typical for the international coal industry and suited to the targeted resources. The open cut mining equipment comprises hydraulic excavators loading off highway rear dump trucks. Support equipment includes bulldozers, drills, water trucks and graders.

MMC/MBGS is satisfied that:

- the major plant items are suited to their intended application at each coal mine;
- plant is well maintained; and
- historical costs and projected costs for repair and maintenance of plant are reasonable.

Glencore forecast capital expenditure for major plant replacement is consistent with the age/condition of equipment and industry practice.

2.4.2 Production Levels

MMC/MBGS reviewed Glencore production forecasts for each coal mine. These forecasts are based on historical performance with increased production included only where clearly defined and realistic operating improvements or expansions have been identified and implemented. MMC/MBGS's review indicates that the overall production under Prodeco management will steadily increase in the period to 2016. This increase will be achieved through operating improvements plus additional output from the development of new mining areas and additional mining equipment. A summary of historical and planned production for the 5 year period from 2009 to 2014 is shown in **Table 2.2.**

Table 2.2 – Saleable Coal Production

Mine Project	2008 (Actual) Mt	2009 (Actual) Mt	2010 (Actual) Mt	2011 (Plan) Mt	2012 (Plan) Mt	2013 (Plan) Mt	2014 (Plan) Mt
Calenturitas	4.7	5.7	5.2	8.5	10.5	12.8	13.3
La Jagua	4.4	4.8	4.8	7.1	7.1	7.1	7.0
Total	**9.1**	**10.5**	**10.0**	**15.6**	**17.6**	**19.9**	**20.3**

MMC/MBGS is satisfied that Glencore production forecasts are realistic and achievable.

For the 2010 production year Prodeco are below budget forecasts. Actual production for 2010 at Calenturitas was 5.2Mt against a budget target of 7.2 Mt. Actual production for 2010 at La Jagua was 4.8 Mt against a budget target of 7.3 Mt.

The following points contributed to the 2010 production statistics:

- Higher than expected groundwater inflows from near surface alluvial aquifers in Sector A at Calenturitas impacted on operations. This issue is now better understood by management and appropriate action to mitigate the risks has been taken. Further, the mine plans and cost forecasts appropriately account for this risk.
- There was a 100% increase in mine operating hours lost to wet weather compared to what was budgeted. This was due to record high rainfall, particularly during the second half of the year. Although a risk exists of a repeat of the higher than average rainfall occurring MMC/MBGS do not believe this would be an annual occurence which would impact on long term forecasts.
- The collective bargaining process in Colombia involves direct negotiations between the parties that can last for up to 40 calendar days. If no agreement is reached during this period, the union may opt to call a strike or to go to arbitration. In 2010 the collective bargaining negotiation with the CDJ union at La Jagua did not result in an agreement after the 40 day period and subsequently the union called a strike which lasted for an additional 38 days. At the end of the strike period an agreement was reached and a new collective bargaining agreement was reached which is effective until 2012.
- Due to high coal inventories in early 2010, Prodeco delayed the purchase of additional waste production fleet. Inventories were depleted when the high rainfall occurredhowever the additional fleet was not available to catch up production.

2.4.3 Management

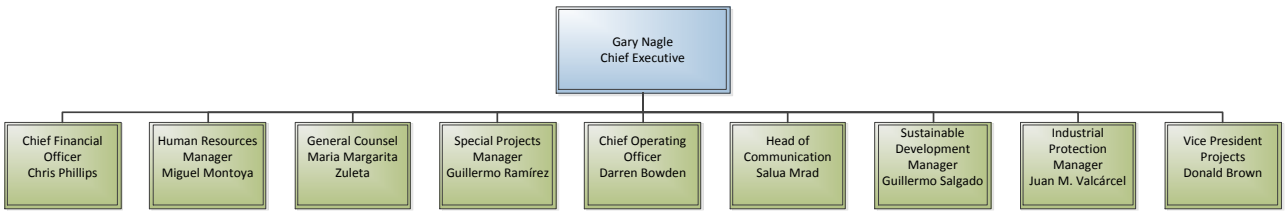
During the conduct of this review, MMC/MBGS project team members were in regular contact and have held numerous discussions with all levels of Prodeco management. Based on this contact, MMC/MBGS is satisfied that:

- Prodeco has established a capable management team at each of its coal mines; and

- coal mine management understands the key drivers and risks at each coal mine and have developed credible mine operation plans that address these issues.

A technical services group within Prodeco coordinates mine planning. This group comprises business development, geological, mining engineering and environmental management. Geological and mine planning functions are maintained at each coal mine and supplemented by outside consultants as required. Each coal mine maintains modern computer-based software for mine planning.

The reported organisation structure of Prodeco is shown below.



2.4.4 Manning Numbers

Table 2.3 summaries the number of employees and contractors at each of the key project locations.

Table 2.3 – Current Manning Numbers

	La Jagua	Calenturiatas	Port	Rail	Admin	Total
Employees	866	808	389	145	206	**2,414**
Contractors	1,222	1,143	505	42	30	**2,942**
Total	**2,088**	**1,951**	**894**	**187**	**236**	**5,356**

2.4.5 Health and Safety

MMC/MBGS reviewed health and safety management systems and their implementation. MMC/MBGS found that an executive safety committee sets health and safety management policy within Prodeco. Prodeco has appointed a Prodeco group safety manager responsible for implementing overall safety strategy and safety management systems.

Direct health and safety responsibility rests with line management and, as is essential in the effectiveness of any system, relies on workforce involvement.

Prodeco undertakes regular audits, both internal and external, at each coal mine. These audits monitor and identify any improvement needs within the safety management systems.

As noted above, Prodeco requires independent operational and safety audits at each coal mine. Wherever these audits identify shortcomings, there is an auditable process in place for rectification and ongoing improvement in the standard of coal mine operations and safety. This process of ongoing audit and improvement is fundamental to a robust, effective and continuously maintained health and safety management system.

Safety performance in 2010 for Prodeco coal mines, expressed as lost time injury frequency rate, is below the average for the national coal industry.

2.4.6 Coal Processing

MMC/MBGS observed that all ROM coal is crushed at each mine and is the loaded into trucks or trains without further processing. Coal is sold "unwashed", meaning there is no metallurgical treatment required to achieve a saleable product. The yield is therefore 100%.

2.4.7 Transport and Port

Coal from the operating mines of Calenturitas and La Jagua is exported primarily through the port of Puerto Prodeco with some shipments through the Carbosan Port at Santa Marta. The coal is railed approximately 220 km to Puerto Prodeco in train sets owned and operated by Prodeco. The rail line is operated and maintained by Fenoco which has been granted the concession from Chiriguana to Santa Marta. Fenoco is owned by the producing coal companies in the Cesar region with Prodeco holding a 39.76% share. Drummond Coal owns 40.96% of Fenoco with the remainder held by Vale, Carboandes and Carbones del Cesar.

Puerto Prodeco is owned and operated by Prodeco and has the capacity to handle up to 17 Mtpa. The coal loading in this area of Colombia is currently undertaken by barge loading and crane transfer to ships. The Colombian Government has decreed that all coal ports are to implement direct ship loading techniques. The government has granted Prodeco a concession in Cienaga and Prodeco are undertaking a project to develop a new coal loading terminal, Puerto Nuevo, scheduled to commence operations in 2013. At that time the existing Puerto Prodeco will be closed down.

The rail and port operations of Prodeco have been planned to match the forecast throughput and Prodeco has exercised control of its future by:

- investing in Fenoco;
- developing facilities at La Jagua and Calenturitas to ensure the trains can be loaded as required;
- establishing its own rail operation;
- expanding the existing port to cope with the growth; and
- constructing a new port to meet forecast throughput and government requirements.

The assets are in generally good condition, and appear to be well maintained and operated.

2.5 Environmental Issues and Management

Hansen Bailey has carried out an environmental review of Glencore's Colombian coal assets including key environmental approval documentation pertaining to its mining operations and port facilities. They have determined environmental management at Prodeco is undertaken generally in accordance with its Environmental Policy. The Environmental Policy forms the foundation of its Environmental Management System (EMS) and describes its vision of environmental management for the mining operations.

The EMS's developed for the Prodeco operations are based on the principles of the ISO14001 international environmental standard. It should be noted that the port facility (Puerto Prodeco) is certified to ISO14001.

Prodeco has undertaken an environmental risk assessment to identify the potential high risk aspects and impacts associated with its activities. Relevant Environmental Management Plans ("EMPs") have been developed to mitigate potential adverse impacts as described in its EMP document. There was evidence of environmental training and general awareness of environmental issues amongst employees.

Environmental monitoring is undertaken in accordance with the relevant EMP which is approved by the Ministry of Environment, Housing and Land Development ("MAVDT"). MAVDT undertakes several site visits per year and reviews the environmental performance of the site against relevant criteria. Prodeco has established environmental monitoring systems to measure its performance and receives regular monthly reports on environmental aspects including surface water, groundwater and ecology. Air quality monitoring is managed by the Regional Environmental Authority ("REA").

There are currently five operating coal mines in the area surrounding Calenturitas, including El Hatillo, Pribbenow, El Descanso, La Francia and Calenturitas. REA commissioned a cumulative air quality impact assessment in 2009 to investigate the potential impacts on local residents and communities located in the area. Results from the assessment indicated that cumulative impacts from the five existing operating mines would adversely impact three local communities (Boqueron, Plan Bonito and El Hatillo). The REA has recommended that the identified communities to be impacted by mining be relocated. Discussions regarding the relocation strategy and responsibility are ongoing and these had not been finalised at the time of this review. A preliminary proposal outlining the shared responsibility between the five mining operations in the area has been put forward by REA. The preliminary proposal includes a methodology to determine the level of contribution of each mining operation. Calenturitas will be required to contribute to the relocation of these communities. The cost of the relocation has been included in the valuation of Calenturitas.

A Biodiversity Offset Management Plan has been developed and will be implemented over the life of the mining projects. It is anticipated that Calenturitas will be required to contribute up to USD 21 Million and La Jagua up to USD 15 Million towards the implementation of the Biodiversity Offset Strategy.

Prodeco has developed Mine Closure Plans for the operations which have been approved by MAVDT. The Mine Closure Plan is reviewed every five years in accordance with MAVDT. There is no rehabilitation security bond required for either La Jagua or Calenturitas.

MMC/MBGS found that Prodeco has developed environmental management systems generally based on international standards. The mines were inspected as part of this review. These inspections found:

- a high level of environmental awareness among senior Prodeco and coal mine staff;
- clear identification of most environmental issues;
- board-level reporting;
- active resolution of identified issues which could have material implications for mining; and
- a high standard of housekeeping.

2.6 Statutory Authorisations

Hansen Bailey reviewed the status of the statutory authorisations for the port facilities and mining operations. Prodeco currently holds all necessary leases and licences to cover exploration and mining activities. A summary of the status of the mining leases and authorisations is set out in the following **Table 2.4**.

Table 2.4 – Prodeco Operations Approvals and Status

Doc.	Detail	Granted	Auth.	Comment	Expiry
CALENTURITAS					
1.	Mining Lease (ML) 044/89	03/07/2005	Ministry of Mining and Energy (MME)	Mining Authority over 6,677 ha	03/07/2035
2.	Works Program (PTI)	2005	MME	Approval to extract up to 7 Million tonnes per annum (Mtpa) ROM Coal	Expires with ML
3.	PTI - Modification	Dec 2010	MME	Proposal to extract up to 14.2 Mtpa ROM coal by 2019, submitted in June 2010, additional information provided in October 2010	Will expire with ML 044/89
4.	Environmental Management Plan	2009	MAVDT	Includes Environmental Management Plans for each aspect of the mining operation	Expires with ML
5.	Environmental Pollution Licence	6/03/2009	MAVDT	The Environmental Pollution Licence is consistent with the EMP's approval No. 0464	Expires with ML
LA JAGUA					
6.	ML - CDJ 285-95	24/04/1997	MME	Mining Authority over area identified as CDJ	23/04/2027
7.	ML - DKP 141	17/12/2004	MME	Mining Authority over area identified as DKP	17/12/2034
8.	ML - HKT 08031	11/11/2008	MME	Mining Authority over area identified as HKT	10/11/2038
9.	ML - CMU 109-90	25/09/1991	MME	Mining Authority over area identified as CMU	24/09/2014
10.	ML - CET 132-92	23/09/1998	MME	Mining Authority over area identified as CET	23/10/2028
11.	PTI	12/04/2010	MME	PTI approved in letter from MME reference 006954 for up to 7 Mtpa ROM coal from 2010 to 2027	Expires with relevant ML
12.	Environmental Management Plan	09/2008	MAVDT	Includes 18 Environmental Management Plans for each aspect of the mining operation	Expires with relevant ML
13.	Environmental Pollution Licence	18/12/2008	MAVDT	The Environmental Pollution Licence is consistent with the EMP's approval No. 2375	Expires with relevant ML
PORT PRODECO					
14.	Environmental Pollution Licence	28/05/2009	MAVDT	License Number 983	Expires with the Port Concession
15.	Port Concession Resolution 097	1/03/2010	MME	Provides for the ongoing use of the Port Facility, MME audit every 6 months to assess progress of New Port	1/03/2011
NEW PORT					
16.	Environmental Pollution Licence 0447	5/03/2010	MAVDT	Provides approval of phase 1 up to a capacity of 35 Mtpa product coal, original Environmental Pollution Licence 0435 dated 02/03/09 modified	Expires with the Port Concession
17.	Port Concession, Resolution 333	4/08/2010	MME	Approval for terrestrial and marine based activities	n/a

Table 2.5 summarises the terminology used in Colombia and for this review.

Table 2.5 – Colombian Terminology

Item	Colombian (Spanish)	Abbreviation
Mining Lease	Titulo Minero	ML
Environmental Management Plan	Plan de Manejo Ambiental	EMP
Environmental Pollution Licence	Licencia Ambiental	EPL
Ministry of Mining and Energy	Ministerio de Minas y Energía	MME
Ministry of Environment, Housing and Land Development	Ministerio de Ambiente, Vivienda Y Desarrollo Territorial	MAVDT
Works Program	Programa de Trabajos e Inversiones	PTI
Regional Environmental Authority	Corpocesar an Corpamag	REA

In MMC/MBGS's opinion:

- appropriate statutory authorisations are in place for each coal mine and relevant project;
- management is taking appropriate steps to maintain statutory authorisations for its coal mines and to obtain, where needed, new statutory authorisations for assets;
- the coal mines are generally operated in accordance with statutory authorisations and are not in material breach of those statutory authorisations. However, there was evidence that issues raised and recommendations made in previous government audits had not been fully implemented at Calenturitas. Prodeco are currently working through the outstanding recommendations. These outstanding items are minor and are not considered material; and
- nothing found during the preparation of the CPR indicated that statutory authorisations will not be renewed as they fall due.

2.7 Costs

2.7.1 Operating Costs

A summary of historical cash cost for each of the operations from 2008 to 2010 are shown in **Table 2.6** and **Table 2.7.**

Table 2.6 – Calenturitas Historic Operating Cash Costs

Activity	2008	2009	2010
Waste Mined (kbcm)	38,334	54,434	42,491[(1)]
Coal Mined (kt)	4,698	5,700	5,234
Strip Ratio	8.2	9.6	8.1
Waste removal ($/t)	17.61	19.88	19.52
Coal mining ($/t)	1.44	1.36	1.66
Mining support ($/t)	4.51	5.24	7.87
Coal handling ($/t)	0.81	0.41	0.49
Admin & Infrastructure ($/t)	1.39	1.63	2.19
Contractor ($/t)	0.04	0.00	0.00
Rail & transport ($/t)	9.38	6.18	6.08
Port ($/t)	5.29	5.47	4.81
Royalty ($/t)	11.35	11.72	6.53
HO & Marketing ($/t)	1.66	1.51	2.24
Total Operating Cost	**53.48**	**53.40**	**51.39**

Note (1): Excludes Boxcut of 8,474 kbcm

Table 2.7 – La Jagua Historic Operating Costs

Activity	2008	2009	2010
Waste Mined (kbcm)	23,616	36,990	30,829
Coal Mined (kt)	4,366	4,787	4,808
Strip Ratio	5.4	7.7	6.4
Waste removal ($/t)	12.76	17.40	21.76
Coal mining ($/t)	1.73	0.95	2.03
Mining support ($/t)	4.96	6.56	7.37
Coal handling ($/t)	1.16	1.34	1.48
Admin & Infrastructure ($/t)	2.06	2.54	3.02
Rail & transport ($/t)	16.71	10.39	9.74
Port ($/t)	5.23	5.37	4.78
Royalty ($/t)	6.26	6.24	4.33
HO & Marketing ($/t)	1.36	1.29	1.52
Total Operating Cost	**52.23**	**52.08**	**56.03**

Prodeco gave MMC/MBGS their current Business Financial Model for review and for use in generating valuations for Calenturitas and La Jagua. The Model is set up to value Calenturitas and La Jagua separately, or both Calenturitas and La Jagua as combined joint operations.

The Business Model is a time based spreadsheet model, allowing for operations from 2011 to 2030 inclusive with yearly time increments. In summary, the Business Model allows for:

- production schedules (mined, railed, shipped);
- mine equipment fleets, operating hours and productivities;
- labour requirements and hours;
- build up of all mine operating costs;
- coal rail, transport and port operating costs;
- equipment capital costs; both initial and replacements;
- non-mining capital costs (infrastructure, coal handling, administration, contractor mobilization);
- coal stocks and working capital calculations;
- depreciation and tax calculations;
- coal pricing and revenues;
- royalty;
- cash flows; and
- discounted cash flow ("*DCF*") and net present value ("*NPV*") analysis.

A summary of life-of-mine (LOM) average operating costs is given in **Table 2.8**.

Table 2.8 – Average LOM Operating Cost

Activity	Calenturitas (US$/t)	La Jagua (US$/t)	Combined (US$/t)
Waste removal	$28.50	$20.22	$25.30
Coal mining	$3.08	$2.66	$2.91
Mining support	$3.15	$3.73	$3.38
Coal handling	$1.04	$0.75	$1.02
Admin & Infrastructure	$1.32	$2.98	$1.96
Rail & transport	$3.35	$5.78	$4.09
Port	$1.61	$1.90	$1.79
Royalty	$10.97	$11.03	$11.01
HO & Marketing	$0.96	$1.40	$1.14
Total Operating Cost	**$53.99**	**$50.46**	**$52.60**

In MMC/MBGS's opinion:

- the assumptions used in developing Prodeco's financial forecasts are reasonable; and
- the operating cost forecasts are realistic and achievable.

2.7.2 Capital Expenditure

Capital costs for each of Calenturitas and La Jagua were reviewed. The term "Initial Capital" refers to the investment required to bring the operations to their full forecast production level. This is spread over several years to match the build up and construction period. Replacement capital allows for the fact that the equipment life is shorter than the mine life and therefore when it is worn out allowance has been made in the model to purchase new equipment. Sustaining capital is a more general allowance for smaller capital items of lower cost (for example computers) that is required on an ongoing basis. A summary of all capital costs is given in **Table 2.9**.

Table 2.9 – Capital Cost Estimates (US$k)

Item	Calenturitas (kUS$)	La Jagua (kUS$)	Combined (kUS$)
Intial Capital			
Waste Removal	$267,443	$50,584	$318,028
Coal Mining	$26,454	$4,620	$31,074
Mining Support	$10,675	$7,347	$18,022
Coal Handling	$23,933	$21,637	$45,570
Admin & Infrastructure	$24,735	$24,567	$49,302
Rail & Transport	$9,061	$4,539	$13,600
Port	$335,233	$167,904	$503,137
HO & Admin Support	$4,331	$2,169	$6,500
Total Initial Capital	$701,866	$283,367	$985,233
Replacement Capital			
Waste Removal	$622,488	$197,077	$819,565
Coal Mining	$87,183	$28,419	$115,602
Mining Support	$54,613	$24,514	$79,127
Total Replacements	$764,284	$250,010	$1,014,295
Sustaining Capital			
Mining Support	$72,000	$71,250	$143,250
Coal Handling	$18,000	$18,000	$36,000
Admin & Infrastructure	$17,600	$26,500	$44,100
Rail & Transport	$3,798	$1,902	$5,700
Port	$3,398	$1,702	$5,100
HO & Admin Support	$12,659	$6,341	$19,000
Total Sustaining	$127,455	$125,695	$253,150
Total Capital	$1,593,605	$659,072	$2,252,677

These expenditure estimates are planned to support each coal mine and to fund the development of projects and expansions.

MMC/MBGS found that capital expenditure for approved projects and coal mine expansions is supported by the appropriate level of feasibility study and engineering design.

The capital allowances made by Prodeco in the forecasts are appropriate and are in line with industry norms.

In MMC/MBGS's opinion, Prodeco's capital expenditure forecasts:

- reflect the current condition of equipment and infrastructure;
- allow for replacement of equipment and facilities as required;
- allow for the development of projects and upgrade of operations to bring new production online; and
- are reasonable and comparable with other coal mines in Colombia.

2.8 Issues and Risks

Coal mining has inherent risk, which is a function of the geological setting and mining methods. These inherent risks can be mitigated by sound management, however they cannot be totally removed. Prodeco has minimised the potential impact of these inherent risks to their overall business by building two mines with multiple pits and also by controlling the transport chain and over time improving this so it is more efficient and less prone to disruption.

MMC note the following potential issues:

- The depth of the Calenturitas pit (> 300 m) increases the risk of potential geotechnical issues in highwall and lowwall stability;
- Due to the proximity of the mines to several rivers the potential effects of flooding causing ingress of water are increased. Prodeco have reduced the risk through the construction of bunds around the mining areas;
- Failure to meet planned production levels caused by events such as higher than average rainfall or strikes will impact on cash flows;

- Geological risk is always present however with progressive exploration drilling and increasing in-pit exposures this risk is constantly being reduced;
- Political activity and government policies;
- Risk in the production build up period. Some items that may impact on the rate of production build up include construction of the new port facility, delivery of new mining equipment or staffing shortages; and
- Prodeco do not currently have approvals in place to implement the final stage of the river diversion at Calenturitas. Failure to gain approvals will impact on mining in Pit B.

MMC/MBGS is satisfied that none of these risks presents any significant threat to the assets of Prodeco because Prodeco:

- is aware of them;
- has addressed and is continuing to address them through prudent and diligent management; and/or
- has made appropriate allowance in its cash flow forecasts.

2.9 Synergies

There are significant synergy opportunities available within the Prodeco operations. In a general sense, these include economies of scale, sharing of expertise and blending synergies, all of which have been discussed elsewhere. Prodeco has realised these opportunities through:

- a flat management structure with low head office overheads. MMC/MBGS observed that the executive management team was aware of issues across the business and spent a significant portion of their available time with site management; and
- integrated production and marketing allowing key productivity drivers at each coal mine to be optimised with a focus on Prodeco's markets.

2.10 Sales and Marketing

MMC/MBGS reviewed exploration data, coal quality analysis, and mining practices and concluded that forecast product quality can be achieved.

The quality of the coal produced by Prodeco is typical for the relevant coal field. The rank of the coal is medium to high volatile bituminous. The coal mines have flexibility to produce to a broad range of specifications by controlling the seam mined, the mining horizon and coal blending. The transport process allows Prodeco to buy in coal and blend products to meet customer specification.

All coal from Calenturitas and La Jagua is sold raw into the export market with a major portion sold blended from both mines to meet a general energy target ranging from 11,100 Btu/lb to 11,500 Btu/lb on a gross, as received (gar) basis. Most coal from La Jagua however, is sold into higher energy markets above 12,000 Btu/lb gar.

Both coal sources have relatively similar thermal properties:

- Total sulphur typically 0.5% to 0.7% gar though both mines have some coal with sulphur in excess of 1% which is blended down to meet specifications. In addition to the high sulphur seams there are also coals with sulphur 0.4% or below;
- Chlorine 0.02% to 0.04% is low to moderate;
- HGI 44 – 48 indicates the coal is moderately hard but this does not impact adversely on grindability when combusted;
- Nitrogen 1.5% to 1.7% is moderate and acceptable in most export markets;
- Ash fusion (reducing condition) Initial Deformation Temperature (IDT) 1250ºC to 1,450 ºC and Flow Temperature 1,450ºC to 1,550ºC. La Jagua has slightly superior ash fusion characteristics likely due to lower calcium and sodium oxides in ash (1% to 2.5%) and (0.5% to 0.8%) respectively compared to Calenturitas (2% to 4%) and (0.8% to 1.5%) respectively though both scenarios are acceptable; and
- Silicon, aluminium and iron oxides in ash are respectively 50% - 57%, 18% - 23%, 9% - 12% for both mines.

2.11 Valuation of Reserves

2.11.1 Methodology and Assumptions

Each of the coal mines that contributes to Prodeco's cash flow forecasts have been valued separately and have been valued using discounted cash flow methods. The cash flows used are those provided by Prodeco in their LOM schedules

as modified by MMC/MBGS to allow for CPR specific requirements such as valuing only reserves and valuing Proved and Probable Reserves separately.

The key valuation assumptions are as follows:

- cash flows are ungeared and unescalated and are real values;
- cash flows have been discounted mid year;
- the valuation is carried out on real post-tax cash flows;
- cash flows have been allocated to Proved and Probable Reserves and valued separately;
- post tax real discount rates for a range of discount rates of 8% to 12% have been applied;
- long term coal prices were provided by Glencore and checked for reasonableness;
- it is assumed that all coal mined is processed and sold in the same year;
- rehabilitation is concurrent with mining and has been allowed for in the operating cost estimates;
- valuation is in USD; and
- plant has not been valued separately. As the plant and equipment is an integral component in the generation of the cash flows used to estimate the value of the Reserves, and the coal mines and projects have in general long lives, the value of the plant and equipment is therefore included in the Reserves value. Any residual value is not considered to be material.

In the Prodeco Business Model coal revenues are estimated by applying assumed future benchmark coal prices to the annual coal quantities given in the production schedules and adjusting for the annual specific energy of the mined coals. MMC/MBGS is not aware of any independent coal pricing and/or marketing studies being commissioned by Prodeco.

Based on specific energy and freight advantages coal sold from La Jagua generally experiences approximately a $6 premium above the bench mark price when sold into the thermal coal market. The premium is usually higher when the La Jagua coal is sold into the metallurgical market.

The benchmark prices and the adjusted prices for each deposit are given in **Table 2.10**.

Table 2.10 – Coal Pricing

Sector	2011	2012	2013	2014	2015	LT
Bench Mark Price						
La Jagua (@12,400BTU)	101.54	115.83	115.09	123.76	124.00	102.00
Calenturitas (@11,300 BTU)	82.35	95.57	95.67	105.99	106.00	85.75
Average Coal Price						
La Jagua	98.68	114.32	112.28	121.74	121.28	96.32
Calenturitas	80.36	93.09	94.00	103.99	104.48	81.59
Average Coal Price	**88.70**	**101.64**	**100.54**	**110.12**	**110.23**	88.38

Supplied by Glencore

2.11.2 Valuations

Based on the methodology and assumptions set out in **Section 2.11.1**, a summary of the NPV valuation carried out by MMC/MBGS for a range of discount rates is included in **Table 2.11.**

A summary of financial analysis for both projects separately and for the combined projects is given in **Table 2.11**.

Table 2.11 – Summary of Financial Analysis

Sector	Units	Calenturitas	La Jagua	Combined
Production				
Peak Coal	Mtpa	~14	~ 7.0	~ 21
JORC Reserve	Mt	209	128	337
Strip Ratio	bcm/t	10.0:1	6.5:1	8.7:1
Operating Costs				
Average	US$/t	$53.99	$50.46	$52.60
Capital Costs				
Life of Mine	US$ M	$1,594	$659	$2,253
Net Present Value				
@ 8% DR	US$ M	$2,786	$2,780	$5,566
@ 10% DR	US$ M	$2,439	$2,446	$4,885
@ 12% DR	US$ M	$2,148	$2,172	$4,320

Table 2.12 shows the attributable value estimated for both Proved and Probable Reserves for each coal mine and project.

Table 2.12 – Valuation of Attributable Reserves @ 10% DR

	Proved Reserve (US$M)	Probable Reserve (US$M)	Total Open Cut Coal Reserve (US$M)
La Jagua	$2,089	$357	$2,446
Calenturitas	$1,775	$664	$2,439
Valuation	**$3,864**	**$1,021**	**$4,885**

2.11.3 Sensitivity Analysis

The values of the coal mines have been tested seperately for sensitivity to movements in the key parameters of operating cost, production, capital cost and coal price.

- Operating Costs - Forecast operating costs are supported by operating history but the mine is expanding and a new port is yet to be built and therefore a 10% sensitivity test is considered appropriate;
- Production - Coal mines can be subject to relatively large short term production variations from plan. However, the likelihood of long term variation is largely mitigated by Prodeco's portfolio of assets, which reduces the impact of poor performance from any one asset and also allows production to be made up from other assets. A sensitivity of 10% is considered appropriate;
- Capital Cost - Prodeco have completed detailed capital cost forecasts. These forecasts, whilst appropriate and not likely to vary much in the short term, may be subject to variation in the medium to long term. Therefore a 25% sensitivity is considered appropriate; and
- Coal Price - Historically export coal prices have been highly variable with the variability largely driven by high barriers to industry entry and exit and a relatively inelastic demand. A 15% sensitivity is considered appropriate for export prices.

A summary of the effect of sensitivity of the valuation of reserves to these variables is included in **Table 2.13.**

Table 2.13 – Sensitivity of Attributable Reserves Valuation

	Base Case Total Value US$M	Operating Cost (+10%) US$M	Production (-10%) US$M	Capital Cost (+25%) US$M	Coal Price (-15%) US$M
Valuation	$4,885	$4,187	$4,052	$4,641	$3,298

2.12 Summary of Conclusions

Table 2.14 – Summary Table – Group Level

	2008A	2009A	2010A	2011E	2012E	2013E	2014E	2015E
Capacity (Mt)	10.1	12.1	14.5	15.6	17.6	19.9	20.3	20.7
Production (Mt)								
Own Mine	9.1	10.5	10.0	15.6	17.6	19.9	20.3	20.7
Third party	1.4	1.0	0.2	-	-	-	-	-
Saleable (Mt)	10.6	10.4	11.7	15.6	17.6	19.9	20.3	20.7
Cash Costs excl. Royalty (US$m)	398.6	450.0	501.0	807.7	826.3	810.6	849.7	854.8
Royalty (US$m)	80.7	96.7	55.0	142.6	194.8	225.4	280.2	276.8
Depreciation & amortisation (US$m)**	77.1	99.5	104.5	125.0	132.7	140.5	153.4	158.7
Tax Rate (%)	12.04***	-9.81***	17.51***	33.0	33.0	33.0	33.0	33.0
Capex (US$m)								
Sustaining	11.7	4.7	7.4	14.4	1.5	1.0	15.0	15.0
Expansionary	296.7	237.0	269.3	564.4	256.3	80.6	102.6	100.4

** *IFRS accounting (not tax)*

*** Effective rate*

Table 2.15 – Summary Table – Calenturitas

	2008A	2009A	2010A	2011E	2012E	2013E	2014E	2015E
Capacity (t)	5.5	7.1	7.2	8.5	10.5	12.8	13.3	13.6
Production (t)								
Own Mine	4.7	5.7	5.2	8.5	10.5	12.8	13.3	13.6
Saleable (t)	4.7	4.7	6.3	8.5	10.5	12.8	13.3	13.6
Cash Costs excl. Royalty (US$m)	197.9	237.6	233.7	481.1	500.9	506.1	552.9	573.6
Royalty (US$m)	53.3	66.8	34.2	76.2	117.7	150.8	182.4	191.8

Table 2.16 – Summary Table – La Jagua

	2008A	2009A	2010A	2011E	2012E	2013E	2014E	2015E
Capacity (t)	4.6	5.0	7.3	7.1	7.1	7.1	7.0	7.1
Production (t)								
Own Mine	4.4	4.8	4.8	7.1	7.1	7.1	7.0	7.1
Saleable (t)	4.5	4.7	5.0	7.1	7.1	7.1	7.0	7.1
Cash Costs excl. Royalty (US$m)	200.7	219.4	246.2	326.6	325.4	304.5	296.8	281.2
Royalty (US$m)	27.3	29.9	20.8	66.4	77.1	74.6	97.8	85.0

MMC/MBGS has reviewed each of the Prodeco assets and has undertaken a valuation of the operating assets included in Prodeco's cash flow forecasts. MMC/MBGS concludes from this review:

- no material flaws, errors or omissions on the technical aspects of the Project were discovered during the review;
- the technical information reviewed is considered reasonable and has been prepared by professionals using appropriate software and industry standards;
- the geological and geotechnical understanding is of a sufficient level to support short, medium and long-term planning as appropriate;
- relevant miing authorities and environmental approvals are in place and new approvals are sufficiently advanced to achieve the proposed future production targets;
- the mine plans appropriately reflect geological and geotechnical understanding and account for predicted mining hazards;
- Prodeco's mining equipment (either in place or planned in the capital forecasts) is suited to its mine plans and supports the production levels forecast;
- the assumptions used in estimating coal and waste production volumes, working room, mining losses and dilutions are appropriate and reasonable;
- coal handling and other infrastructure including rail and port are capable of supplying appropriate quality products to satisfy the export markets at the forecast volumes;
- environmental issues are generally well managed and there are no issues that could significantly impede production nor are any prosecutions pending;
- the assumptions used in estimating operating costs are appropriate and reasonable, covering the spectrum of mining, processing, coal transport, and site administration associated in getting the coal to the point of sale;
- capital costs used in the financial models reflect the mine plans, development and construction schedules and the forecast production levels;
- key risks identified by MMC/MBGS are understood by management and appropriate action to mitigate these risks has been taken. Further, the mine plans and cost forecasts appropriately account for these risks; and
- the drivers of the production and cost forecasts are understood by management and are receiving the management focus required.

MMC/MBGS is of the opinion that the Colombian coal assets of Prodeco:

- represent a significant component of the Colombian coal industry;

- have mine plans over areas of Measured and Indicated Resources which generate forward schedules for more than 19 years;
- have a total value of Proved and Probable Reserves of approximately USD 4,885 million with 75% of this value associated with Proved Reserves; and
- have value that is most sensitive to changes in coal price with a 15% reduction in coal price decreasing reserve value by over 32 % to USD 3,298 million.

3. CALENTURITAS COAL MINE

3.1 Description

Calenturitas commenced operation over 10 years ago but only established a box cut with the mine remaining on a "care and maintenance" basis for a number of years. Full scale production re-commenced in early 2004 with the establishment of a strip mine on the eastern subcrop of the coal deposit.

The mining rate in 2011 is planned for 8.5 Mtpa increasing to approximately 14 Mtpa by 2015. This involves opening up and developing three active pits (called Sectors A, B and C) to provide the working area required to support this mining rate. This development strategy also ameliorates many of the possible mining risks such as flooding, short term geological issues and geotechnical instability. It also allows for blending of the different seams to provide uniform quality.

The Calenturitas River meandered across the northern part of the deposit from northeast to southwest and has been diverted in order to extract the coal. Infrastructure including workshops, offices and coal handling facilities is located in the central part of the deposit above the deeper coal.

The Calenturitas site visit confirmed the following:

- the equipment is owned and managed by Prodeco;
- some contractors are used for maintenance (such as Chaneme and Gecolsa which is known as a "MARC" or maintenance and repair contract);
- stage 1 of the river diversion, which covers the current mining limits of Sector A is in place. A second diversion is required for the mining of the southern portion of Sector B. Approvals for the second diversion have not been granted;
- sufficient land has now been purchased for the operational requirements;
- the railway loading facility is installed and working;
- Sector C is fully developed with haulback in to in-pit dumps;
- Sector A is being opened up;
- Sector B has yet to commence;
- additional equipment is required for the mine expansion; and
- new offices and workshops have just been completed.

3.2 Maps and Plans

The regional location of the mine is shown on **Figure 1**. Typical stratigraphy and a cross section showing the geological structure is shown on **Figures 3** to **Figure 4**.

3.3 Geology

3.3.1 Regional Geology

The Calenturitas coal deposit is part of Tertiary coal-bearing sediments preserved in the Cesar-Rancheria Basin. This basin is limited tectonically by the Oca Fault in the north and the Bucaramanga-Santa Marta Fault in the south and west. Two other structural settings control the basin limits, the igneous and metamorphic complex of Sierra Nevada de Santa Marta to the north and the Serrania de Perija to the southeast. These mountain ranges are an extension of Colombia's Eastern Cordillera.

The basin is subdivided into the Rancheria Basin in the north where Cerrejon Mine is located and Cesar Basin in the south which contains La Jagua and Calenturitas mines. Continuity of coal measures between the two sub-basins has not been demonstrated.

Outcrop in the Cesar-Rancheria Basin ranges from Jurassic to Quaternary in age. The unit containing the main coal seams is the Los Cuervos Formation of Palaeocene to early Eocene age. Los Cuervos Formation conformably overlies the Barco Formation which consists of massive sandstone units and the coal-bearing Los Cuervos Formation is unconformably overlain in some areas by coarse-grained sediments of the Cuesta Formation. This unconformable surface does not erode coal measures in the Calenturitas lease area, however in some areas to the west and southwest of Calenturitas, erosion of coal measure strata is apparent on the basis of seismic and borehole information. Alluvial sediments overly the coal-bearing strata at Calenturitas and these sediments are predominantly fine to coarse grained sand ranging from 5 m to 40 m thick. The Los Cuervos Formation is between 250 m and 1,600 m thick.

The tectonic setting is predominantly compressive with northeast trending thrust faults that divide the basin into a number of northeast-oriented elongate blocks within which the strata have been folded with the Los Cuervos coal seams brought

up to the surface by the thrust faults. (see **Figure 2**). Most of these blocks are the focus of a number of open cut operations such as Pribbenow, El Descanso, La Francia, El Hatillo, Calenturitas and La Jagua.

Extensive 2D seismic surveys have identified three main thrust structures that govern the distribution of coal measure strata into structural blocks – El Hatillo Fault; La Loma Fault; El Tigre Fault. Within each structural block, the disposition of the coal seams is controlled by the main fold structures – El Boqueron Syncline; La Loma Syncline (Calenturitas Mine); El Descanso Syncline; La Jagua Syncline.

3.3.2 Site Geology

The Calenturitas coal deposit occurs within a northeast-trending asymmetrical syncline, the axis of which plunges at less than 10º towards the southwest (see **Figure 2**). Seams dip at 5º to 10º on the northeastern nose of the syncline (Sector A). Seam dips increase along the limbs of the syncline to 18º along the eastern limb (Sectors C and D) and up to 55º on the western limb (Sector B). Coal seams are relatively flat-lying in the vicinity of the synclinal axis with dips less than 10º observed on seismic lines crossing the area.

The Calenturitas deposit is divided into sectors A to D based on geological/geographical and mining characteristics. The majority of exploration drilling has focussed on the northern and eastern margins (Sectors A, C and D) of the deposit and as a result, the seams in those areas are mostly classified as Measured Resources. Coal resources in the western area (Sector B) tend to be classified as Indicated or Inferred because of the effect of steeply dipping strata and further drilling is required in that area to elevate resource to Measured status. Resources within the deeper area of the syncline (close to the axis) have not been classified due to the lack of drill hole information in this area and these resources are not included in the current Calenturitas life of mine plan. These resources will be the subject of studies related to the potential for future underground mining.

Figure 4 shows typical cross-sections through the deposit

3.3.3 Stratigraphy

The Los Cuervos Formation comprises three stratigraphic units; a lower unit containing interbedded claystone, siltstone and thin coal bands; a middle unit that contains the economic coal seams; an upper unit of primarily fine to medium grained sandstone interbedded with siltstones. A typical stratigraphic column for the Cesar Basin and geology of Calenturitas is presented in **Figure 3** shows how the coal seams at Calenturitas are correlated with those of the La Jagua deposit.

At Calenturitas, a total of 47 seams sub-crop along the western and eastern limbs of the syncline (C420 to C100). Seam C420 is the uppermost coal seam and Seam C199 is at the base of the main economic sequence, a stratigraphic interval approximately 245 m thick with 30 m of cumulative coal thickness. Seams C200 and C270 Upper and Lower are the thickest coal seams (average 4 m) and Seams C330, C310, C270, C260, C250, C210 and C200 contain an intra-seam stone parting greater than 0.10 m thick (see **Figure 5**). Some of the seams below Seam C199 (down to Seam C130) are considered to be economically mineable in parts of the deposit thickness. There are a number of thin seams below C130 however they tend to be quite thin (<0.5 m) and as they appear to have no economic significance, they have not been included in the Resource estimate.

3.3.4 Structure

The Calenturitas coal deposit is in an asymmetrical syncline aligned northeast to southwest and plunging at a shallow (<10°) angle towards the southwest. The seams dip at 5° to 10° on the northeastern nose of the syncline ("*Sector A*"). Seam dips increase along the limbs of the syncline to 14° and 18° along the eastern limb ("*Sector C*") and up to 50° on the western limb ("*Sector B*") and in the eastern limbs of Sector A. Coal seams are flat lying in the vicinity of the synclinal axis with dips less than 10° observed along seismic lines crossing the area. On the basis of seismic data at least five thrust faults (Maracas, Calenturitas, La Loma, La Francia and El Tigre) oriented NE-SW have been interpreted affecting the deposit. The Calenturitas Fault and The El Tigre Fault have the greatest impact on dip angles in the eastern flank of the syncline with fault throws greater than 50 m.

3.3.5 Resources

The JORC Code identifies three levels of confidence in the reporting of Resources categories as follows:

- Measured: that part of Coal Resources for which tonnage, densities, shape, physical characteristics, and coal quality can be estimated with a high level of confidence;
- Indicated: can be estimated with a reasonable level of confidence; and
- Inferred: can be estimated with a low level of confidence.

Coal Resources within the Calenturitas coal tenements total **400** million tonnes (Mt) to a depth in excess of 400 m, comprising:

- **170 Mt** of Measured Resources;

- **160 Mt** of Indicated Resources; and
- **70 Mt** of Inferred Resources.

Table 3.1 – Calenturitas Gross and Net Attributable Resources (as of 31st December 2010)

Sector	Measured (Mt)	Indicated (Mt)	Inferred (Mt)	TOTAL (Mt)
A	103.9	57.7	50	211.6
B	0.0	98.0	12	110.0
C/D	69.0	5.4	8	82.4
Totals	**172.9**	**161.1**	**70**	**404**
Rounded	**170**	**160**	**70**	**400**

Because of the shallow southwesterly plunge of the Calenturitas Syncline, the coal seams intersected in drill holes in Sector C and Sector B on the eastern and western limbs of the syncline respectively, may occur in the core of the syncline in the south of Calenturitas, but at considerable depth. This deep coal is considered to be an exploration target in the order of 300M-400M tonnes, provided the coal seams in Sectors B and C maintain their thickness at depth. This tonnage range was estimated on the basis of including all seams down dip of Sectors B and C where the dip of the seams is more than 10 degrees (to an approximate depth of 600m). Below that depth, within a zone proximal to the synclinal axis, where the strata dip is likely to be less than 10 degrees, Resource tonnages for the thicker seams only (seams C400 – 1.9m, C330 – 2m, C270 – 3m, C200/199 – 5m) were estimated. The potential tonnage is conceptual only as there is no drill data that confirms the thickness or even the presence of coal in the deeper part of the syncline, although historical seismic surveys, conducted by Ecopetrol and some private hydrocarbon exploration companies, have clearly delineated the shape of the synclinal fold at depth. There has been insufficient exploration, however, to define a Coal Resource and it is uncertain if further exploration will result in the determination of a Coal Resource.

3.3.6 Resource Coal Quality

The geological model has utilised all the coal quality data obtained in previous exploration programs since the early 1990's. Average estimated in situ moisture was determined from total moisture analysis of core samples which had been sampled and placed in cold storage immediately after the sample was retrieved on the surface. A sub-sample of the crushed coal was analysed for relative density together with air dried moisture and ash from proximate analyses. Using the Preston-Sanders equation, the RD was converted to the average in situ moisture basis. Ash was also converted to in situ moisture basis.

The average coal qualities for each seam are presented in **Table 3.2**.

Table 3.2 – Calenturitas Resource Coal Qualities by Seam (@moisture Insitu)

Seam	Density (t/cu.m)	Ash (%) is	Energy (BTU/lb) is	Total Sulphur (%) is	Volatile Matter (%)is	Total Moisture (%) is
C420	1.32	6.0	10,860	1.43	36.2	14.7
C410	1.35	9.6	10,329	3.44	35.6	14.9
C400	1.30	3.9	11,142	0.55	35.6	14.7
C390	1.31	4.8	11,067	1.36	37.1	14.5
C380	1.32	5.7	10,915	0.74	35.3	14.7
C375	1.35	10.0	10,000	0.90	35.0	12.0
C370	1.33	7.0	10,739	1.12	35.7	14.7
C360	1.32	6.4	10,843	0.83	35.2	14.5
C359	1.31	5.2	11,056	1.24	36.0	14.3
C350	1.35	10.0	10,000	0.90	35.0	12.0
C345	1.31	4.9	11,303	0.68	36.6	13.3
C340	1.30	3.8	11,454	0.65	36.6	13.3
C335	1.34	8.3	10,795	0.64	35.5	13.5
C330	1.29	3.0	11,549	1.14	36.7	13.4
C329	1.32	6.8	11,097	1.98	36.8	13.0
C325	1.36	10.4	10,532	3.68	36.9	13.4
C320	1.31	5.6	11,109	0.84	35.0	13.7
C310	1.30	3.5	11,497	0.64	36.4	13.3
C300	1.31	4.8	11,310	0.81	35.8	13.3
C290	1.42	17.7	9,543	2.11	32.5	13.3
C285	1.33	7.6	10,949	0.79	36.1	13.1
C280	1.30	4.4	11,342	0.71	35.9	13.4
C270U	1.30	3.6	11,483	0.37	35.3	13.3
C270L	1.31	4.6	11,351	0.47	34.8	13.3
C260U	1.35	9.9	10,615	0.40	32.3	13.3
C260L	1.35	9.7	10,645	0.45	33.2	13.3
C250U	1.32	5.9	11,425	0.46	36.4	12.3
C250L	1.33	6.9	11,287	0.47	36.4	12.3
C240	1.30	4.3	11,647	0.46	36.9	12.3
C230	1.38	13.3	10,420	1.61	34.1	12.2
C220	1.32	6.4	11,350	0.69	35.9	12.3

C210U	1.32	6.6	11,325	0.44	34.2	12.3
C210L	1.32	6.3	11,370	0.44	34.6	12.3
C200U	1.29	2.1	11,945	0.41	36.4	12.3
C200L	1.29	2.5	11,895	0.41	36.2	12.3
C199	1.29	3.1	11,819	0.45	36.9	12.3
C195	1.35	10.0	10,000	0.90	35.0	12.0
C190U	1.35	10.3	10,783	1.11	35.7	12.4
C190L	1.33	7.9	11,116	1.08	36.5	12.4
C185	1.35	10.0	10,000	0.90	35.0	12.0
C180	1.30	4.0	11,696	0.61	34.7	12.3
C175	1.38	13.3	10,474	1.62	33.1	12.0
C170	1.31	5.6	11,489	1.08	35.9	12.1
C169	1.32	6.8	11,134	0.63	36.9	13.0
C165	1.34	8.2	11,101	2.73	35.3	12.3
C160	1.30	4.3	11,651	1.21	35.3	12.2
C155	1.33	6.9	11,253	2.49	35.8	12.4
C140U	1.32	5.7	11,628	0.86	36.7	11.4
C140L	1.31	4.6	11,818	1.21	36.4	11.3
C130U	1.32	6.2	11,617	0.68	35.9	11.1
C130L	1.32	6.5	11,571	0.68	35.9	11.2
TOTAL	**1.3**	**4.9**	**11,425**	**0.7**	**35.8**	**12.9**

3.4 Mining

3.4.1 Reserves

The process used in converting the Coal Resources into Coal Reserves included the following:

- The latest (October 2010) geological model was used to update the Life of Mine Plan;
- Pit limits incorporate physical boundaries such as river diversions (now completed), lease boundaries, sub crops of the coal seams and economic limits (determined as the coal seams get deeper);
- Appropriate and reasonable allowances were made for mining recovery; losses and dilution for the proposed equipment and past experience;
- Coal is not washed and hence no metallurgical factors were applied; and
- Based on the level of confidence in the mine planning, all of the Indicated Resources within the practical pit shell are classified as "Probable Reserves" and the Measured Resources within the practical pit shell are classified as "Proved Reserves". Inferred Resources were not included in the Reserves.

The difference between the Measured and Indicated Coal Resources (330 Mt) and the Coal Reserves (209 Mt) is explained by the following:

- there are geological and mining losses and dilution gains in the Reserves estimation;
- minimum coal seam thickness rules have been applied in estimating Reserves; and
- the Measured and Indicated Resource polygons extend beyond the practical pit shell in some instances.

The review and cross reference against the JORC Code check list showed no material omissions and confirmed that the reserve estimating process is in compliance with JORC guidelines.

Total Coal Reserves are **209 Mt** including 113 Mt of Proved Coal Reserves and 96 Mt of Probable Coal Reserves. The average coal quality is 11,112 BTU/lb (ar), ash 7.2% (ar) and sulphur 0.6% (ar). As received moisture is 12%. Coal Reserves are classified based on the level of detail completed in the mine planning and also the level of confidence in the Resources. Coal Resources are reported inclusive of Coal Reserves (that is, Coal Reserves are not additional to Coal Resources).

Table 3.3 – Calenturitas Gross & Attributable Coal Reserves (as of 31st December 2010)

Date	Proved (Mt)	Probable (Mt)	Totals (Mt)
Reserves 31st Dec 2010	**113**	**96**	**209**

3.4.2 Mining Operations

The Calenturitas coal deposit can be characterised as a deep, multiple seam, sub-cropping and steep to moderately dipping synclinal basin. The dipping nature of the coal structure makes it suitable for excavation using conventional open cut mining methods that initially excavate low strip ratio sub-cropping coal followed by deeper coal mining that progresses from one end of the deposit to the other.

A combinatation of small and large hydraulic excavators (100 t - 550 t) are used to load overburden into off highway rear dump trucks which haul the material to a combination of inpit and expit dumps.

Coal mining is by a combination of hydraulic excavators working in tandem with dozers. Medium sized backhoes excavate the overburden and interburden to near the contacts between waste and coal. Smaller dozers or flat bladed small hydraulic excavators clean the waste materials from the coal roof contact. The care taken in this method determines the amount of both loss and dilution. Finally, excavators dig the waste material which has been heaped by the dozers.

In determining the pit layout Prodeco has made considerations for working room, slope angles, safety considerations, haul road designs, production requirements and materials balance. All pits have been designed to operate with ramp access developed in the advancing faces, these ramps will carry all coal haul trucks to the surface and waste trucks either to the surface or to benches with direct access to the horizontal haul back roads to the in-pit waste dumps.

Coal is hauled to the ROM pad located at the current coal handling facility.

3.4.3 Production Schedules

Key production scheduling criteria included:

- mining from the three pits at the same time;
- nominal 3 months in-pit coal inventory; and
- maximum coal production of 14.3 Mtpa (9.5 Mtpa from Sector A, 2.0 Mtpa from Sector B and 2.8 Mtpa from Sector C).

The mine scheduling blocks have been sequenced into a logical mining progression. All pits have been sequenced with a layback angle of 11°-15° on the advancing face. The resulting waste and coal production schedule is given in summary in **Table 3.4**.

Table 3.4 – Calenturitas Waste and Coal Production

Seam	Waste (Mbcm)	ROM Coal (Mt)	Strip Ratio (bcm/t ROM)	ROM Energy @12.5% moist. (BTU/lb)
2011	90.7	8.5	10.7	11,027
2012	102.8	10.5	9.8	11,006
2013	109.7	12.8	8.6	11,102
2014	127.7	13.3	9.6	11,086
2015	133.4	13.6	9.8	11,138
2016	133.6	14.0	9.6	11,132
2017	134.2	14.2	9.5	11,114
2018	134.8	14.1	9.6	11,150
2019	133.2	14.3	9.3	11,158
2020	135.2	14.1	9.6	11,131
2021	133.0	14.0	9.5	11,137
2022	127.3	12.1	10.5	11,149
2023	118.7	11.4	10.4	11,107
2024	116.2	10.9	10.7	11,082
2025	105.6	8.6	12.3	11,125
2026	105.7	8.5	12.4	11,053
2027	88.8	8.7	10.3	11,040
2028	62.7	5.3	11.4	11,097
Total	**2,093.3**	**208.8**	**10.0**	**11,112**

Note: Additional non JORC Reserve in the LOM Pit shell could potentially extend mine life by approximately 3 years

3.4.4 Mining Equipment

Large production equipment currently operates on a 7-day, 2 x 12-hour roster with 3 panels. Although equipment is scheduled to work 7 days at 24 hours per day, there are many factors that reduce the actual operating time.

Table 3.5 shows the typical main equipment types and numbers operating at Calenturitas.

Table 3.5 – Calenturitas Fleet Numbers

Category		Size	2010
Budget Coal		Mt	7.2
Budget Waste		Mbcm	67.0
Waste Equipment	**Specification**		
Excavators	O&K RH340	34 cu.m	1
	EX 3600	23.5 cu.m	5
	O&K RH120-E	17 cu.m	4
	O&K RH40-E	6 cu.m	5
Haul Trucks	Caterpillar 793C	220 t	7
	Caterpillar 789C	180 t	28
	Caterpillar 777F	91 t	42
Drills	Drill	55,000 lb	8
	Drill	40,000 lb	3
Dozers	Caterpillar D10T	433 kW	5
	Caterpillar D9R	302 kW	8
	Caterpillar 834G	358 kW	4
Coal Equipment			
Excavator	O&K RH 40-E	8 cu.m	3
	Cat 330	2 cu.m	5
Haul Truck	Caterpillar 777F	91 t	9
Dozers	Caterpillar D10T	433 kW	3
	Caterpillar D7R	171 kW	5
	Caterpillar 834G	358 kW	2
Support Equipment			
Excavators/FEL	Caterpillar 988G	6.4 cu.m	4
Haul Truck	Caterpillar 763F	91 t	5
Grader	Caterpillar 16H	205 kW	11
Water Truck	Caterpillar 777	100 t	5

3.4.5 ROM Coal Quality

Average ROM coal qualities for each seam are presented in **Table 3.6**.

Table 3.6 – Calenturitas Average ROM Coal Qualities by Seam (@12.5% moisture)

Seam	Density (t/cu.m)	Ash (%) is	Energy (BTU/lb) is	Total Sulphur (%) is	Volatile Matter (%)is
C420	1.4	10.9	10,219	1.3	34.4
C410	1.4	16.5	9,417	3.4	33.0
C400	1.3	5.2	10,973	0.6	35.2
C390	1.3	8.4	10,606	1.4	35.9
C380	1.3	7.9	10,627	0.8	34.5
C375	1.4	17.1	9,093	0.9	32.5
C370	1.4	11.0	10,210	1.1	34.2
C360	1.4	9.3	10,465	0.8	34.2
C359	1.4	9.5	10,499	1.0	34.5
C350	1.5	27.1	7,872	0.8	28.7
C345	1.4	9.8	10,656	0.7	34.8
C340	1.3	6.9	11,039	0.6	35.5
C335	1.4	16.1	9,716	0.7	32.6
C330	1.3	4.1	11,400	1.1	36.3
C329	1.4	12.5	10,320	1.9	34.9
C325	1.4	17.4	9,591	3.5	34.1
C320	1.4	13.0	10,092	0.9	32.4
C310	1.3	6.0	11,165	0.6	35.5
C300	1.3	7.5	10,952	0.8	34.8
C290	1.5	23.6	8,737	2.0	30.3
C285	1.4	12.4	10,322	0.7	34.4
C280	1.3	8.5	10,777	0.7	34.5
C270U	1.3	4.2	11,399	0.4	35.1
C270L	1.4	10.0	10,624	0.5	33.1
C260U	1.4	12.8	10,213	0.5	31.5
C260L	1.4	16.9	9,666	0.5	30.9
C250U	1.3	6.8	11,289	0.5	36.1
C250L	1.4	17.1	9,909	0.5	32.8
C240	1.3	5.8	11,439	0.5	36.3
C230	1.4	19.4	9,613	1.3	31.8
C220	1.4	12.1	10,579	0.7	33.8
C210U	1.3	8.1	11,107	0.5	33.8
C210L	1.4	13.3	10,383	0.5	32.2
C200U	1.3	2.4	11,914	0.4	36.3

C200L	1.3	4.8	11,589	0.4	35.5
C199	1.3	5.6	11,482	0.5	36.0
C195	1.5	21.8	8,543	1.0	31.1
C190U	1.4	14.7	10,200	1.1	34.1
C190L	1.4	17.4	9,834	1.0	32.9
C185	1.4	15.8	9,318	0.9	32.9
C180	1.3	6.8	11,302	0.6	33.9
C175	1.4	18.7	9,720	1.5	31.2
C170	1.3	7.6	11,218	1.1	35.1
C169	1.4	13.7	10,174	0.6	34.7
C165	1.4	11.1	10,721	2.7	34.4
C160	1.3	6.6	11,343	1.2	34.5
C155	1.3	9.0	10,980	2.5	35.2
C150	1.4	11.4	10,877	1.7	34.1
C140U	1.4	11.8	10,724	0.9	35.0
C140L	1.3	7.6	11,398	1.2	35.4
C130U	1.3	8.6	11,294	0.7	35.1
C130L	1.4	13.9	10,541	0.6	33.4
TOTAL	**1.3**	**7.2**	**11,112**	**0.7**	**34.9**

3.5 Coal Handling & Processing

Calenturitas coal is not washed; there is no wash plant for either Calenturitas or La Jagua coal. ROM coal is sized and sold as product coal.

ROM coal from the Calenturitas mine is truck dumped into a 320 t hopper and fed through both primary and secondary sizing, weighed, sampled and stacked via a linear stacker onto the product stockpile at a rate of up to 3,000 tph. The stockpile is designed to hold 80,000 t of live coal in two grades. Dozer pushout of the pile will enable up to 400,000 t of product coal to be stockpiled.

A new truck dump area will be operational in 2011 with a 60 t hopper feeding to one of two radial stackers onto the product stockpile. Two grades of coal with 30,000 t live capacity for each grade (60,000 t total) can be stockpiled. Dozer pushout can increase the stockpile to 350,000 t.

Beneath the stockyard is a 4,000 tph reclaim conveyor fed by eight valves which can be controlled to blend the coal being loaded into the trains. Coal is weighed and sampled before entering a 360 t surge bin above the rail loadout. A Coalscan device is fitted to the base of the inclined belt and provides instantaneous quality control.

A 65 t batch weigh bin prepares the coal for the final loading into the rail wagons.

There are stockpiles at the mine to facilitate blending and to smooth fluctuations in coal supply due to weather and interruptions to the continuity of coal supply due to equipment maintenance and other interruptions.

There are variations in coal quality between each seam and between each pit. Blending is achieved by:

- mining from different pits during the one shift;
- mining from different seams;
- blending at the crusher;
- blending on the stockpile before the train is loaded; and
- further blending at the port(s).

3.6 Long Term Prospects

The Calenturitas deposit has to a large extent been optimised with limited upside in extending the economic pit limits or the annual mining rate. There are opportunities to mine from the high wall with underground techniques such as highwall miners, augers and traditional underground mining. These methods have not been examined in the current mine plan.

4. LA JAGUA COAL MINE

4.1 Overview

The La Jagua coal deposit is contained within an isolated, elongated basinal structure (La Jagua Syncline) and is typified by the presence of a prominent hill (Cerro de Piedra) overlying the coal reserves in the southern part of the deposit.

La Jagua had many local producers operating in the deposit during the 1990's. Five years ago there were three companies producing coal out of the La Jagua deposit; Carbones del Caribe ("*CD*"), Concorcio Minero Unido ("*CMU*") and Carboandes ("*CA*"). Prodeco purchased these leases and consolidated what were three different mine plans into a single operation which provided the opportunity to develop a mine plan that delivered the maximum recovery of coal otherwise lost in the boundary between each lease.

Prodeco bought the main lease of the deposit and established the company Carbones de La Jagua ("*CDJ*") in 2005. In 2006, Prodeco purchased CMU and in 2007 the CA Lease was acquired and the new company Carbones El Tesoro ("*CET*") was formed. Each company previously developed separate areas of the deposit which created the South Pit , North Pit, El Tesoro Pit and the CMU Pit. CDJ/CMU/CET now operates all three areas as one operation.

Prodeco mines La Jagua in combination with the other Prodeco coal deposit, Calenturitas, located 20 km west of La Jagua. By operating both deposits under similar management and pooling resources, costs can be reduced and revenue can be optimised by blending coal.

The target production from the La Jagua deposit is 7 Mtpa. The mine is being developed from the north to south using Caterpillar haul trucks loaded by O&K excavators. The entire deposit (except for a small wedge in the north) will be mined with underburden on the western side due to geotechnical constraints. Mining under the Tucuy River will commence in 2014. New offices and workshop facilities are currently being built and will be completed early 2011.

The mining sequence is based on haulback mining progressing south along the length of the deposit. This allows in-pit dumping, thereby minimizing ex-pit dump size. This also results in a better final landform because more material is backfilled into the mined out areas.

Coal is hauled from the pit to the ROM stockpile were it is stockpiled according to coal quality. Coal is crushed to size and loaded to road trucks where it is hauled to Calenturitas for blending and train load out for transport to the port. The coal is not washed.

Most of the product coal is primarily sold on the international market as a thermal coal with approximately 0.5 Mt to 1.5 Mt of La Jagua coal sold as high volatile PCI. The coal has a track record with recognition in the market and its energy and relatively low sulphur content makes it attractive in the market place. Some of the quality characteristics of the La Jagua coal would lend it to potential sales into the high volatile PCI markets. The coal is marketed by Glencore, the owner of Prodeco.

4.2 Maps and Plans

The regional location of the mine is shown on **Figure 1**. Typical stratigraphy and a cross section showing the geological structure is shown on **Figures 9** and **Figure 10**.

4.3 Geology

4.3.1 Site Geology

La Jagua is a multi-seam coal deposit in a northeast-oriented synclinal basin structure, approximately 5km long and 2km wide. The deposit dips steeply on the northwest and southeast flanks. The centre of the deposit is flatter with dips up to 5 degrees. On the basis of borehole and mining records to date, two faults have been identified within the deposit, La Victoria and La Nueva faults. La Victoria is a southwest-trending normal fault with a throw up to 20 m parallel to and close to the syncline axis. La Nueva Fault has been interpreted from drill hole data and occurs to the west of La Victoria Fault and has a throw up to 10 m. A series of geological cross sections, illustrating the synclinal shape and distribution of coal seams are presented in **Figure 9**. A significant topographic feature which impacts on the open cut strip ratio is the hill in the southern half of the deposit (Cerro de Piedra).

4.3.2 Stratigraphy

A typical stratigraphic column for Cesar basin and geology of La Jagua is illustrated in **Figure 2** and a coal seam correlation with Calenturitas is shown on **Figure 3**.

A total of 23 seams with a cumulative thickness of approximately 35 m occur within the La Jagua deposit sub cropping along the western and eastern limbs of the syncline. Seam M0 is the uppermost coal seam and Seam M45 is at the base of the main economic sequence – a stratigraphic interval approximately 200 m thick. Seam M15 is the thickest coal seam (average 5m) and seams M2 and M3 contain a thin intra-seam stone band.

4.3.3 Resources

Coal Resources within the La Jagua area total **140** million tonnes (Mt) comprising:

- **117 Mt** of Measured Resources;
- **23 Mt** of Indicated Resources; and
- **There are no Inferred** Resources.

Table 4.1 – La Jagua Gross and Net Attributable Resources (as of 31st December 2010)

Sector	Measured (Mt)	Indicated (Mt)	Inferred (Mt)	TOTAL (Mt)
Totals	117.2	23.1	0.0	140.3
Rounded	**117**	**23**	**0**	**140**

4.3.4 Resource Coal Quality

The average estimated in situ moisture was determined from total moisture analysis of core samples which had been sampled and placed in cold storage immediately after the core reached the surface. A sub-sample of the crushed coal was analysed for relative density together with an air dried moisture and ash from proximates. Using the Preston Sanders equation, the RD was converted to the average in situ moisture basis at 7.5%. Ash was also converted to 7.5% moisture basis.

Average coal qualities for each seam are presented in **Table 4.2**.

Table 4.2 – La Jagua Resource Coal Qualities by Seam (@ 7.5% moisture ar)

Seam	Density (t/cu.m)	Ash (%)	Energy (BTU/lb)	Total Sulphur (%)	Volatile Matter (%)
M00	1.32	4.2	12,460	1.3	38.8
M01	1.36	8.6	11,750	1.1	38.0
M02U	1.32	2.5	12,673	0.6	38.3
M02L	1.34	7.6	12,039	3.8	38.5
M03U	1.31	2.8	12,795	0.5	38.8
M03A	1.35	5.8	11,927	0.8	37.5
M03B	1.35	7.6	12,072	0.9	36.7
M04	1.33	5.0	12,439	2.4	39.7
M05	1.30	2.8	12,798	0.8	38.6
M08	1.33	4.6	12,235	0.9	37.4
M09	1.34	7.5	12,033	0.8	35.8
M10	1.30	2.6	12,777	0.9	37.7
M11	1.33	6.0	12,265	2.3	39.1
M15	1.30	2.4	13,068	0.4	37.4
M17	1.34	6.6	12,126	0.6	36.4
M20	1.32	4.0	12,764	0.4	36.9
M25	1.32	4.2	12,717	1.0	36.8
M27	1.48	23.1	9,795	0.5	27.5
M28	1.37	9.1	11,596	0.8	37.4
M30	1.33	5.7	12,407	0.5	36.1
M35	1.30	3.0	12,988	0.7	36.7
M40	1.32	4.7	12,718	1.1	38.3
M45	1.30	2.2	13,071	0.6	37.3
Average	**1.31**	**3.8**	**12,741**	**0.8**	**37.4**

4.4 Mining

4.4.1 Reserves

The process used in converting the Coal Resources into Coal Reserves included the following:

- The latest (October 2010) geological model has been used to update the Life of Mine Plan;
- The mine design includes all coal in the basin;
- The side slopes have been flattened to allow for stability. This means some waste material below the lowest coal seam has to be mined;
- Pit limits incorporate physical boundaries such as river diversions, lease boundaries, sub crops of the coal seams and economic limits (determined as the coal structure gets deeper);
- Appropriate and reasonable allowances have been made for mining recovery; losses and dilution considering the proposed equipment and past experience;

- Coal is not washed and hence no metallurgical factors have been applied; and
- All of the Indicated Resources within the practical pit shell are classified as "Probable Reserves" and the Measured Resources within the practical pit shell are classified as "Proved Reserves". There are no Inferred Resources.

The difference between the Measured and Indicated Coal Resources (140 Mt) and the Coal Reserves (128 Mt) is explained by the following:

- geological and mining losses and dilution gains in the Reserves estimation;
- a small portion of Resource coal falling outside the practical pit shell; and
- minimum thickness rules being applied in estimating Reserves.

Coal Reserves total **128 Mt** comprising 106 Mt of Proved and 22 Mt of Probable Coal Reserves as shown in **Table 4.3.**

The average strip ratio over the mine life is 6.6 bcm/ tonne. The average coal quality is 12,154 BTU/lb (ar), ash 8.4% (ar) and sulphur 0.78% (ar). As received moisture is estimated at 8.0%. Coal Reserves are classified based on the level of detail completed in the mine planning and also the level of confidence in the resources. Coal Resources are reported inclusive of Coal Reserves.

Table 4.3 – La Jagua Gross & Attributable Coal Reserves (as of 31st December 2010)

Date	Proved (Mt)	Probable (Mt)	Totals (Mt)
Coal Reserves 31st December 2010	**106**	**22**	**128**

4.4.2 Mining Operations

The La Jagua coal deposit consists of 23 seams and can be characterised as a deep, multiple seam, sub-cropping and steep to moderately dipping synclinal basin. The dipping nature of the coal structure makes it suitable for excavation using conventional open cut mining methods that initially excavate low strip ratio sub-cropping coal followed by deeper coal mining that progresses from one end of the deposit to the other.

A combinatation of small and large hydraulic excavators (100 t - 550 t) are used to load overburden into off highway rear dump trucks which haul the material to a combination of in-pit and ex-pit dumps.

Coal mining is by a combination of hydraulic excavators working in tandem with dozers. Medium sized backhoes excavate the overburden and interburden to near the contacts between waste and coal. Smaller dozers or flat bladed small hydraulic excavators will clean the waste materials from the coal contact. The care taken in this method determines the amount of both loss and dilution. Finally, excavators dig the waste material which has been heaped by the dozers.

In determining the pit layout Prodeco have made considerations for working room, slope angles, safety considerations, haul road designs, production requirements and materials balance. All pits have been designed to operate with ramp access developed in the advancing faces, these ramps will carry all coal haul trucks to the surface and waste trucks either to the surface or to benches with direct access to the horizontal haul back roads to the in-pit waste dumps.

4.4.3 Production Schedules

All pits have been sequenced with a layback angle of 11°-15° on the advancing face. The resulting waste and coal production schedule is given in summary in **Table 4.4**.

Table 4.4 – La Jagua Waste and Coal Production

Seam	Waste (Mbcm)	ROM Coal (Mt)	Strip Ratio (bcm/t ROM)
2011	47.1	7.1	6.6
2012	49.7	7.1	7.0
2013	49.6	7.1	7.0
2014	53.9	7.0	7.7
2015	54.5	7.1	7.7
2016	54.5	7.2	7.6
2017	54.4	7.0	7.8
2018	54.7	7.1	7.7
2019	54.6	7.1	7.7
2020	54.5	7.0	7.8
2021	52.1	7.0	7.4
2022	52.0	7.0	7.4
2023	45.0	7.0	6.4
2024	40.9	7.1	5.8
2025	35.0	7.1	4.9
2026	30.0	7.1	4.2
2027	25.0	6.0	4.2
2028	24.0	6.0	4.0
2029	7.5	2.9	2.6
Totals	**839.9**	**128.2**	**6.5**

4.4.4 Mining Equipment

Large production equipment currently operates on a 7-day, 2 x 12-hour roster with 3 panels.

Table 4.5 shows the typical main equipment type and number operating at La Jagua.

Table 4.5 – La Jagua Fleet Numbers

Category		Size	2010
Budget Coal		Mt	7.3
Budget Waste		Mbcm	49.5
Waste Equipment	**Specification**		
Excavators	PC 5500	34 cu.m	1
	O&K RH170	22 cu.m	4
	O&K RH120-E	17 cu.m	3
	O&K RH40-E	6 cu.m	4
Haul Trucks	Caterpillar 789C	180 t	24
	Caterpillar 777F	91 t	44
Drills	Drill	55,000 lb	3
	Drill	40,000 lb	2
Dozers	CaterpillarD10R	425 kW	3
	CaterpillarD9R	302 kW	7
	Caterpillar834G	358 kW	3
Coal Equipment			
Excavator	O&K RH 40-E	8 cu.m	3
	Catepillar 330DL	2.5 cu.m	6
Haul Truck	Caterpillar 777F	91 t	6
Drills	Drill	40,000 lb	1
Dozers	Caterpillar D9R	302 kW	3
	Caterpillar 834G	358 kW	3
	Caterpillar D7R	171 kW	3
Support Equipment			
Excavators	Caterpillar 988G	6.4 cu.m	3
	Caterpillar 330DL	2.5 cu.m	2
Haul Truck	Caterpillar 777F	91 t	5
Grader	Caterpillar 16H	205 kW	6
Water Truck	Caterpillar 777	100 t	4

4.4.5 ROM Coal Quality

Average ROM coal qualities for each seam are presented in **Table 4.6**.

Table 4.6 – La Jagua ROM Coal Qualities by Seam (@ 8.0% moisture ar)

Seam	Ash (%)	Energy (BTU/lb)	Total Sulphur (%)	Volatile Matter (%)
M00	12.9	11,360	1.35	35.9
M01	19.7	10,383	1.02	34.2
M02U	6.1	12,355	0.61	37.5
M02L	19.5	10,347	3.30	33.9
M03U	6.9	12,244	0.50	37.4
M03A	23.2	9,846	0.70	32.2
M03B	17.1	10,767	1.08	33.5
M04	12.7	11,399	2.51	37.0
M05	5.4	12,459	0.84	37.8
M08	14.4	11,142	0.89	34.6
M09	22.7	9,964	1.15	30.9
M10	10.1	11,790	0.83	35.3
M11	22.5	9,904	2.90	32.8
M15	4.1	12,847	0.35	36.9
M17	19.1	10,602	0.54	32.6
M20	9.0	12,115	0.38	35.3
M25	8.2	12,223	0.99	35.6
M27	33.5	8,499	0.48	24.4
M28	26.7	9,427	0.71	31.8
M30	11.5	11,734	0.47	34.5
M35	5.7	12,602	0.71	35.9
M40	7.5	12,316	1.11	37.5
M45	4.8	12,751	0.60	36.5
Average	**8.3**	**12,163**	**0.77**	**35.9**

4.5 Coal Handling & Processing

La Jagua coal is not washed; there is no wash plant for either La Jagua or Calenturitas coal. ROM coal is sized and sold as product coal. There is no rail connection between La Jagua and Calenturitas. The coal from La Jagua is generally trucked 20 km to Calenturitas.

Prodeco is currently relocating and upgrading the La Jagua ROM stockpiles at Las Flores with new primary and secondary sizing and an overhead bin for truck loading scheduled to be operational in early 2011. The bin has been designed to batch weigh the coal and load 35 t, 50 t and 70 t trucks. Additionally, the National Highway between La Jagua and Calenturitas is to be fully sealed by July 2011 to improve the truck cycle time. A new contract for the coal haulage is being negotiated and will include the required truck fleet to support the proposed throughput.

The product stockpiles at Calenturitas facilitate blending and smoothe fluctuations in coal supply due to weather and interruptions to the continuity of coal supply. There are variations in coal quality between each seam and between each pit and blending is achieved in a similar fashion as described for Calenturitas in **Section 3.5**.

4.6 Long Term Prospects

The La Jagua deposit has to a large extent been optimised with limited upside in extending the economic pit limits or the annual mining rate.

5. PORT AND RAIL

5.1 Overview

Coal from the operating mines of Calenturitas and La Jagua is exported primarily through the port of Puerto Prodeco with some shipments through the Cabosan Port at Santa Marta port. The coal is railed approximately 220 km to Puerto Prodeco in train sets owned and operated by Prodeco. The rail line is operated and maintained by Fenoco which has been granted the concession from Chiriguana to Santa Marta. Fenoco is owned by the producing coal companies in the Cesar region with Prodeco holding a 39.76% share. Drummond Coal owns 40.96% of Fenoco with the remainder held by Vale, Carboandes and Carbones del Cesar.

Puerto Prodeco is owned and operated by Prodeco and has the capacity to handle up to 17 Mtpa. The coal loading in this area of Colombia is currently undertaken by barge loading and crane transfer to ships. The Colombian Government has decreed that all coal ports are to implement direct ship loading techniques. The government has granted Prodeco a concession in Cienaga and Prodeco are undertaking a project to develop a new coal loading terminal, Puerto Nuevo, scheduled to commence operations in 2013. At that time the existing Puerto Prodeco will be closed down.

5.2 Rail

5.2.1 Fenoco Track

Fenoco is a company incorporated to hold the rail concession from Chiriguana to Santa Marta. Currently, the only traffic on the rail line is coal transported from the Cesar region to the ports of Rio Cordoba, Drummond and Puerto Prodeco for various coal companies which are also shareholders of Fenoco.

The Fenoco main line is a narrow gauge line (914 mm) covering a distance of approximately 200 kms (excluding Calenturitas spur). The various mines and ports are connected to the main line at various points. The actual main line has been and is continuing to be upgraded; initially through the construction of sidings to increase its capacity and ultimately through the construction of a parallel railroad. The construction phases are being carried out by Fenoco. The original timetable for construction of the parallel line has been delayed for a number of reasons including approval processes. **Figure 12** shows the expected track configuration in 2011 when existing duplications are connected.

An area known as Sector 2 from km 865 to km 922 (57 km) does not have an environmental licence for construction due to encroachment by local communities. A number of alternative rail operation scenarios are being considered and negotiated with the government to ensure that adequate capacity is available when required through an alternative alignment for the second line through Sector 2 or through placement of additional passing loops.

In the sector from Puerto Drummond to Puerto Prodeco a curfew restriction was imposed on the operation and trains are not allowed to use that section between 2300 hr and 0500 hr, which limits the operations of Prodeco into their port. This will be immaterial in 2013 when the new port becomes operational as it branches off the main line before the Drummond port. In the last two quarters of 2012 the night time restrictions will be an issue for Prodeco. Management have developed appropriate procedures to implement as required including partial easing of the restrictions and/or additional rolling stock.

5.2.2 Prodeco Rail Operation

Prodeco has developed its own above rail operations with a fleet of 18 x GE C21 locomotives and 700 x FreightCar America coal wagons with nominal 60 t load and bottom dump doors. Operations commenced in 2008 and have been steadily increasing throughput, delivering 10.8 Mt in the 2010 calendar year.

Current operations use trains made up of two locomotives and 97 wagons carrying 5,820 t. The average theoretical cycle time is approximately 19.5 hours although non-operational delays such as the night restrictions into the port and passing loop delays increase the current cycle time to an average 24.5 hours. The capacity of the existing rail fleet under current conditions is 14.5 Mtpa. It is expected that the cycle time can be reduced with the completion of Fenoco track duplications which will enable faster running times, improved unloading rates at the port with the recent port expansion and the use of an additional standby siding at the port which reduces the impact of the night restrictions. The anticipated rail fleet capacity in 2011, considering the night restrictions, is 15.9 Mtpa.

To cope with future forecasts a number of alternatives are being considered including:

- some direct trucking of coal to Carbosan port rather than transporting by rail to Puerto Prodeco and loading trucks at the port to transport on to Carbosan port;
- negotiating some easing of the night time restrictions for a limited period of time; and
- adding an additional train consist which will increase the capacity to 16.7 Mtpa.

When Puerto Nuevo becomes operational, the train sizes will increase to 3 locomotives and 133 wagons hauling 7,980 t. With 5 train sets and the reduced cycle times the capacity will increase to approximately 21.9 Mtpa. The loading capacity at Calenturitas and the unloading capacities at Puerto Prodeco and Puerto Nuevo will always be higher than the rolling stock capacity.

5.3 Port

5.3.1 Puerto Prodeco

Puerto Prodeco is located 15 km south of Santa Marta. The operation has been continuously expanded over the last few years and the latest expansion to 17 Mtpa was completed in May 2010. The port is a barge loading facility and was started after a port concession was granted in 1979. Until 2008, coal was transported to the port by road trucks travelling 227 km from the mines.

Rail operations commenced with trains dumping through one 3,000 tph unloading pit and the coal being sent either to 2,500 tph stacking conveyors or directly to the barge loading conveyor with 2,500 tph capacity. In 2009 a port upgrade was commenced to increase the port capacity from 11 Mtpa to 17 Mtpa. The upgrade involved a second rail unloading pit, a second radial stacker, a second surge bin, and a barge loading system with 3,000 tph capacity. Additionally, a system for reloading trucks for transport to Carbosan port was installed.

The terminal operates with small stockpiles; maximum 300,000 t with up to 60% of coal being directly loaded into barges from the trains. Seven barges (5 x 2,800 t and 2 x 3,000 t) have been operating in 2010. Two more barges have been purchased and will be operational from January 2011.

Ocean going ships are moored at one of 3 mooring points located 2.75 km offshore. The mooring points are capable of accommodating large Capesize vessels up to 180,000 dwt. The October 2010 year-to-date shipping mix is 20% Handy, 35% Capes and 45% Panamax. Coal is transferred from the barges to the ships by cranes. The crane operation is contracted to Louis Dreyfus Armateurs and as at 1 January 2011 there will be four cranes in operation; 1 x 35 t, 2 x 25 t and 1 x 17 t with a backup 15 t crane held in reserve.

The Puerto Prodeco operation will be closed down in 2013 when Puerto Nuevo becomes operational.

5.3.2 Puerto Nuevo

In 2007 the Colombian government decreed that coal loading ports should be direct loading and the practice of indirect loading via barges should be eliminated. Prodeco, after committing to the new port construction in Cienaga, were granted an extension of the operational concession Puerto Prodeco until the new port is operational.

The land based environmental impact statement (EIS) has been completed and an Environmental License issued. The marine concession has been granted and the marine EIS completed with an environmental license granted. The marine areas are under appeal by Drummond; but are expected to be resolved by early 2011.

The port is designed for a capacity of 27 Mtpa and will include:

- a rail loop enabling one train (3 Locomotives and 133 wagons) before and one train after the dump station;
- an inbound storage track parallel to the loop track to allow queuing of one additional train;
- an outbound storage track parallel to the loop track to allow the unloading of two consecutive trains;
- an 8,000 tph dump station;
- 2 x 8,000 tph stacker reclaimers servicing a central 1 Mt stockyard;
- a 1.7 km long conveyor trestle;
- a 350 m long loading pier, 21 m wide;
- 1 x 8,000 tph ship loader capable of slewing to load on either berth; and
- a 8.5 km navigation channel, 20.3 m deep and a ship turning basin.

The design is consistent with recent developments and current design proposals elsewhere in the world; particularly in Australia where NCIG in Newcastle commissioned its 30 Mtpa first stage in 2010. Similar 30 Mtpa designs are proposed for Wiggins Island in Gladstone, Australia and for Abbot Point near Bowen in Australia.

Modeling of the new terminal has been undertaken by Sandwell, demonstrating that under the proposed operating conditions the port terminal is capable of handling 27 Mtpa. The assumptions used in the modeling appear appropriate and the results are consistent with modeling and performance evaluation of similar direct loading terminals around the world.

The modeling assumed that the Fenoco main line could operate with 20 minute headways and that duplication of the main line will be complete. This implies that a cycle time of approximately 12 hours will be required. Since there is some risk that the duplication will not be completed we have reviewed this aspect. Prodeco has modeled the 22 Mtpa operation and has used a cycle time of 15 hours which is consistent with dynamic simulation results from the Inteplan model of the system when Sector 2 is not duplicated. An additional passing loop at Nuevo Sevilla is included. The potential throughput of Drummond and the other rail users is important in determining the timing of additional rail infrastructure. We believe that the 22 Mtpa throughput will be achievable and that there is scope for additional throughput with the implementation of efficiencies such as reduced maintenance possessions and additional passing loops on the Fenoco track infrastructure.

5.4 Cost Estimates

Cost estimates have been provided by Prodeco, and have been analysed and reviewed.

5.4.1 Operating Costs

Rail costs have been budgeted based on historical performance and use forecast throughputs to calculate forward costs.

Table 5.1 – Rail Costs

Year	Below Rail		Above Rail		Total Rail	
	US$/t	US¢/ntk	US$/t	US¢/ntk	US$/t	US¢/ntk
2010 (9 mths)	2.45	1.2	2.71	1.4	5.16	2.6
2011	2.56	1.3	2.28	1.1	4.83	2.4
2012	2.66	1.3	2.39	1.2	5.05	2.5

Above Rail costs include o'heads, amortization and depreciation

Benchmark figures in Australian coal regions would be in the range of 0.6US¢/ntk – 1.7US¢/ntk below rail and 2.5US¢/ntk above rail. The below rail cost is at the upper end of general benchmark ranges and is associated with the significant capital investment undertaken by Fenoco recently and ongoing and the current exclusive use of the rail line by coal exporters. The above rail cost, operated by Prodeco, is particularly competitive.

Prodeco holds a concession with the Colombian government to operate a Port on the coast just south of the city of Santa Marta. After coal is unloaded from the trains it is stockpiled or else loaded directly via conveyor onto barges. Tugboats tow the barges to floating cranes offshore which then transfer the coal from the barges to the ship.

This facility has limited capacity in its current form and the government policy is to build a new "direct loading port" further south. This will allow for expansion as well as reducing operating costs by 66% as the tugboats, barges and floating crane will not be required.

Table 5.2 shows port operating costs at Puerto Prodeco:

Table 5.2 – Port Costs

Year	Operating US$/t	Overheads US$/t	Totals US$/t
2010 (9 mos)	$4.24	$0.97	$5.21
2011	$3.99	$1.16	$5.16
2012	$3.78	$1.08	$4.86

Overheads include amortization and depreciation

The barge loading port is scheduled to be closed down in 2013 when Puerto Nuevo commences operations.

Operating costs for the new direct loading port have been estimated by Sandwell for an annual throughput of 23 Mtpa as US$1.20/t. The savings compared to the existing port arise from reduced manning levels (260 compared to 400), higher handling rates, higher throughput and removal of costs associated with barges and cranes. Depreciation is assumed to be approximately US$1.60/t giving a total estimated operating cost for Puerto Nuevo of US$2.80/t. Benchmark rates in Australia for new and existing expanded terminals are in the order of US$4/t - US$6/t although the new proposed terminal in Gladstone has been reported as US$9/t. The rate for the existing port is similar but the new port will be considerably cheaper due to the lower labour rates and lower capital cost.

5.4.2 Capital Costs

There appear to be no major capital expenses scheduled in 2011 for the rail operation other than completion of rail connections and crossings on the mine spur line, maintenance equipment and fire suppression installation in locomotives. Total capital required for rail in 2011 is approximately US$6 million.

The existing port requires capital in 2011 of US$3.6 million for dry-docking of barges, US$1.2 million for tugboat dry-docking and US$1.4 million for D10 equipment. Other capital items include berths for the additional cranes, warehouse equipment, barge mooring and utility vehicles. Total capital required for theexisting port in 2011 is approximately US$7 million.

The major forecast capital expenditure is for the new port at Puerto Nuevo is US$528 million. The capital cost estimate for development of Puerto Nuevo is given in **Table 5.3**. At the end of 2010 approximately US$56 of this budget estimate has been spent.

Table 5.3 – Puerto Nuevo Capital Costs (US$ millions)

Item	Capital Cost (US$ mill)
Trestle/Pier	$111.1
Dredging	$33.1
Coal Handling	$138.8
Infrastructure	$76.5
Other Direct Costs	$33.4
Total Direct Costs	**$392.9**
Indirect Costs – Owner	$42.6
Land	$20.1
Financing – Taxes	$40.3
Total Indirect Costs	**$103.0**
Contingency	$32.1
Total with Contingency	**$528.0**

For the scope of work proposed this is less than might be anticipated when comparing against similar developments elsewhere in the world and is also lower than the Sandwell estimate of US$844 million. Installed capacity in Australia is often quoted as US$30 – US$50 per Mt of throughput whereas Puerto Nuevo is proposed at US$20/Mt of annual throughput. Prodeco has undertaken significant negotiation with prospective contractors both on cost and scope and the lower estimate is based on the results of these negotiations.

Sandvik has been awarded the Coal Handling contract and the Onshore Civil, Marine Civil and Dredging contracts should be awarded by December 2010. Phase 1 of the onshore civil works is almost complete with major earthmoving to form the rail loop, stockyard, screening bunds and drainage channels.

5.5 Summary

The rail and port operations of Prodeco have been planned to match the forecast throughput and Prodeco has exercised control of its future by:

- investing in Fenoco;
- developing facilities at La Jagua and Calenturitas to ensure the trains can be loaded as required;
- establishing its own rail operation;
- expanding the existing port to cope with the growth; and
- constructing a new port to meet forecast throughput and government requirements.

The assets are in generally good condition, and appear to be well maintained and operated.

Annex A – Qualifications and Experience

Grant Walker – Consulting Mining Engineer at Minarco-MineConsult - Bachelor of Engineering - Graduate Diploma in Applied Finance - Member of Australasian Institute of Mining and Metallurgy

Grant has over 15 years experience as a mining engineer, initially with operational experience at a number of coalmines in Australia and Indonesia, and later as a consultant. He has extensive experience of reserve calculation, mine design, feasibility studies and bankable documents and has developed and continues to operate a coal supply cost model for the Australian coal industry.

Grant has worked on numerous mine valuations, technical audits, operational assessments and coal supply studies within Australia, Colombia and other overseas countries and has carried out numerous due diligence exercises for financiers and investors.

Grant is a Competent Person as described by the JORC Code.

Kerry Whitby - Managing Director of McElroy Bryan Geological Services Pty Ltd - Bachelor of Science - Fellow of Australasian Institute of Mining and Metallurgy - Member Australian Institute of Geoscientists - Member Geological Society of Australia

Kerry Whitby is the Managing Director of McElroy Bryan Geological Services Pty Ltd, a consulting company based in Sydney, Australia that focuses on providing technical support and advice to the international coal exploration and mining industry. Kerry has been employed by the company since 1971. In that time he has been responsible for designing, implementing and managing coal exploration programmes in all major coal basins within Australia as well as a variety of coal deposits in South America, Africa and Asia. Over the last 15 years, Kerry has been involved in the preparation of geological appraisals, resource estimates and technical opinions related to project valuations on behalf of numerous companies in a variety of locations including Australia, U.K, U.S.A, Canada, Colombia, Mozambique, South Africa, Botswana, Mongolia, China, Indonesia, Sarawak, Myanmar and Bangladesh. Kerry is a Competent Person as described by the JORC Code and a Qualified Person in relation to NI 43-101.

Bob Leach

Bob Leach is a self employed coal quality consultant with a B Sc in Chemistry and M Sc in Primary Metallurgy. His current work committment involves diligence exercises conducted on behalf of several major companies focusing their attentions in the coal and related industries, peer review of project work and management of several coal quality and coal preparation projects located within Australia and internationally. He has worked on over 50 coal quality and coal preparation projects in the past ten years, within Australia and overseas. These projects have targeted either or both, thermal and coking coal products. Some current and recent projects are:

- Hinton Project, Canada for Coalspur Coal Ltd,
- Baruun Naran, Mongolia, for QGX Ltd,
- Donkin project Nova Scotia Canada, for Xstrata,
- Wandoan, Australia, for Xstrata,
- Calenturitas and La Jagua, Colombia, for Prodeco (Glencore).

Ben Eastwood - Senior Environmental Scientist at Hansen Bailey – Bachelor of Natural Resource Management (2nd class Hons)

Ben Eastwood is a senior environmental scientist with over seven years experience in both coal mine site environmental management and in the gaining of mine planning approvals. Ben has recently project coordinated mining authorities applications for the West Muswellbrook Project and has just completed an Environmental Assessment for the Continuation of Boggabri Coal Mine in the Gunnedah Coal Basin of NSW.

Ben has also conducted numerous due diligence audits for large scale coal mining and exploration projects throughout Australia. Ben has lived and worked in South America for six years and has a good understanding and appreciation of the people and culture. Ben is fluent in South American Spanish.

Ian Travis - Managing Director at Inteplan Pty Limited – Bachelor of Engineering (Hons) – MIEAust, CPEng, FCIT, MAICD

Ian was responsible for planning the expansion of the Port Waratah Coal Services Carrington Terminal during the 1980s and gained considerable experience in the management/planning of coal stockpiling systems. In 1989 Ian became Chief Executive of a joint venture company developed to promote major infrastructure projects, and held senior management positions with rail rolling stock manufacturers.

In 1991 Ian founded Inteplan Pty Limited, a consultancy service providing assistance to numerous logistics based industries with the main focus being Coal Export Supply Chain development; intermodal infrastructure capacity/development; rail industry business development; and freight contract development. Clients have included most major coal producers, port operators and banks. Significant work has been undertaken to provide expert advice on coal system capacities including for the development of Newcastle Coal Infrastructure Group and for coal export systems in Colombia, Russia and New Zealand.

Annex B – Glossary of Terms

acid mine drainage	Acidic run-off water from mine waste dumps and mill tailings ponds containing sulphide minerals. Also refers to ground water pumped to surface from mines. Such drainage often requires treatment to buffer acidity.
adb	Air dried basis, defining the moisture basis for coal quantity and quality parameters
adit	A horizontal or nearly horizontal entrance/access to an underground mine from the surface.
ar	As received basis, defining the moisture basis for coal quantity and quality parameters
alluvial	Relatively recent deposits of generally poorly consolidated sedimentary material laid down in river beds, flood plains and lakes.
ANFO	Acronym for Ammonium Nitrate and Fuel Oil, a mixture used as a blasting agent in many mines.
angle of repose	The maximum angle from horizontal at which a given material will rest on a given surface without sliding or rolling.
anthracite	Coal of the highest rank with a carbon content above 92%. This type of coal has a semi-metallic lustre
anticline	A line or axis to which strata rise from both directions in an arch shape.
aquifer	A water-bearing bed of permeable rock.
Ash	The inorganic residue remaining after a pulverised sample of coal is incinerated under standard laboratory conditions
attributable production	That part of the mine or operation production in which Glencore has an economic interest. It therefore excludes production attributable to the interests of any other partners
attributable reserves	That part of the reserves from a mine or project in which Glencore has an economic interest. It therefore excludes reserves attributable to the interests of any other partners.
attributable resources	That part of the resources from a mine or project in which Glencore has an economic interest. It therefore excludes reserves attributable to the interests of any other partners.
attributable sales	That part of the sales from a mine or project in which Glencore has an economic interest. It therefore excludes reserves attributable to the interests of any other partners.
A$	Australian dollars
bank cubic metre	The volume in cubic metres of an excavation measured in place before being disturbed
basalt	Fine grained igneous rock from an extrusive lava flow
basement	The older rock mass which underlies an ore body or a sedimentary basin. Often refers to rocks of Precambrian age which may be covered by younger rocks.
beneficiation	Treatment of mined coal by either drying, flotation, or gravity to improve the quality of the product material.
bord and pillar	A mining method for underground mines in which supporting pillars are formed as the development proceeds, and which may or may not be subsequently mined

calorific value	The heat of combustion of a unit quantity of coal; expressed in either British thermal units per pound (Btu/lb), kilocalories per kilogram (kcal/kg) or megajoules per kilogram (MJ/kg). The gross calorific value includes all heat of vapourisation of water. Net calorific value assumes that all water is in the vapour phase. See "*specific energy*".
Carboniferous	The period from about 345 to 280 million years ago. It is part of the Paleozoic era
Chapter 19	Chapter 19 of the London Stock Exchange Listing Rules
CHPP	Coal Handling and Preparation Plant
coal, bituminous	A rank of black coal
coal, coking	Coal which is suitable for marketing and use as metallurgical coal, which is generally used in the steel making process
coal, high vol PCI	Coal which is suitable for direct injection into blast furnaces in a pulverized state and which has a high level of volatile matter
coal measures	A sequence of strata deposited within the same geological period that contains coal seams
coal, metallurgical	A broader term for describing coal which comprises both coking coals and PCI coals, both of which are used in the steel making process
coal, semi-soft	Coal which is not sutiable as a hard coking coal but is suitable as a component in coke oven blends
coal, thermal	Coal which is combusted to provide heat for steam generation and subsequent power generation, or burned for heat generation only
comminution	The physical breaking of the rock and coal into smaller sizes
Competent Person	A professionally qualified specialist defined in Chapter19.
conglomerate	A coarse grained sedimentary rock comprising large fragments set in a fine grained matrix of sand and cementing material
CPR	Competent Person's Report
CSN	Crucible Swell Number; a measure of the swelling properties of coal when heated; one of the most common tests to determine coal suitability for coking
dilution	The contamination of ore with barren or low grade rock during the mining process; effectively lowering the grade of the mined ore.
dyke	Igneous material cutting across the strata usually in a vertical or near vertical plane
fault	A fracture in the earth one side of which is displaced with respect to the other in any direction
fluvial	Pertaining to rivers. River environment for deposition of material
FOB	Free on board; commonly used to describe quantities or costs to deliver coal loaded onto a coal carrying ship
FOR	Free on rail; commonly used to describe quantities or costs to deliver coal loaded onto rail cars.

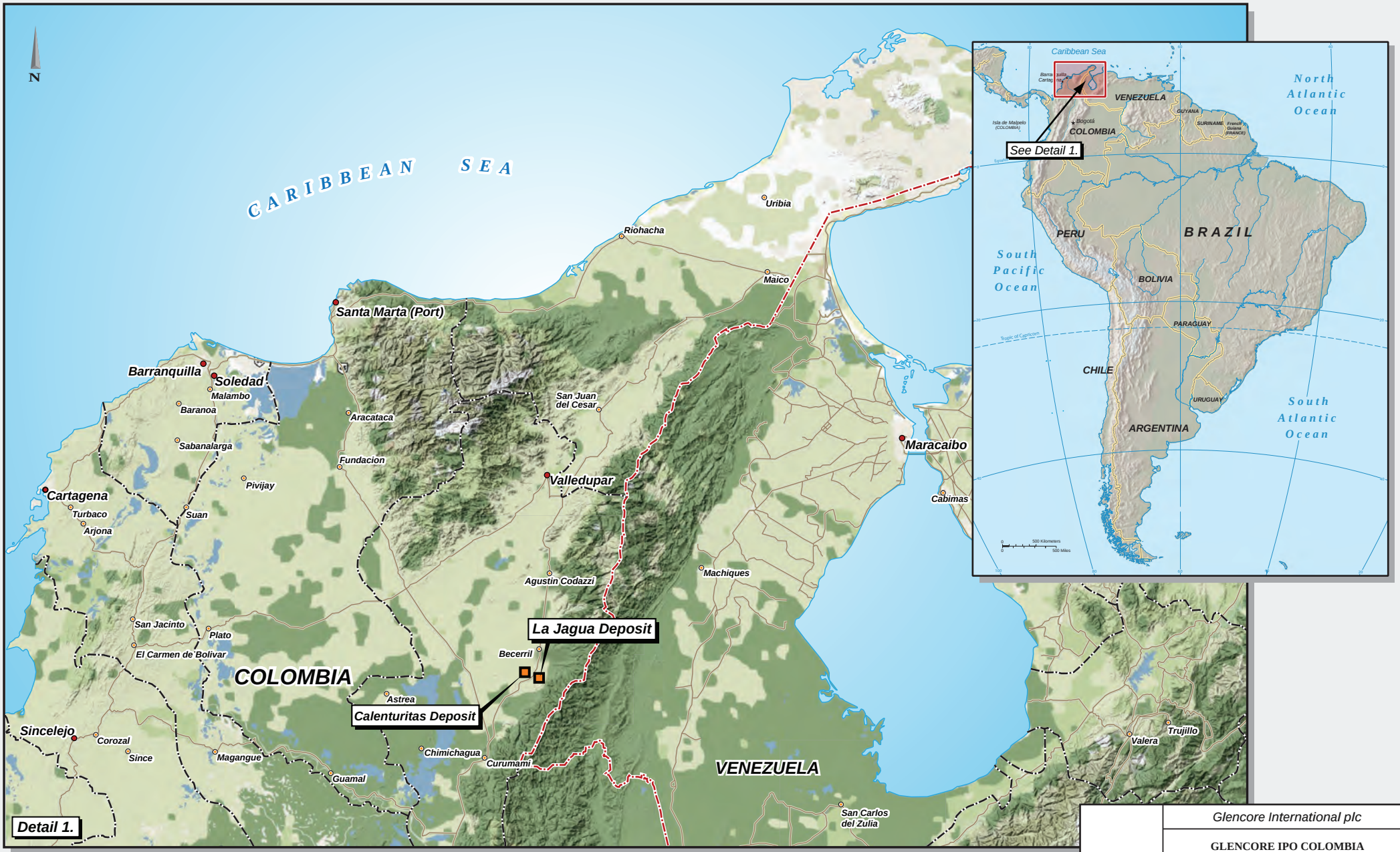
fold	Deformation of the strata due to tectonic forces
froth flotation	A coal cleaning process applied for the beneficiation of fine particles typically 0.5 millimetres in diameter. Hydrophobic coal particles attach themselves to air bubbles in a water medium and rise to the surface to form a froth
gar	Gross as received basis
geotechnical	The engineering properties of rocks
Glencore	Glencore International AG
graben	The lowering of strata between two fault planes forming a block of overburden rock interrupting the continuity of the coal seam
grade	The quality of an ore, alloy or metal; often expressed as a percentage contained within an ore, but sometimes a combination of numerous properties
greenfields	A location where no previous mining activity has taken place
Hansen Bailey	Hansen Bailey Environmental Consultants
Igneous	Material that has originated from a molten state
In situ	Material in the ground in its natural state; not mined, not processed
Inteplan	Inteplan Pty Limited, coal logistics consultants
interburden	Rock material separating coal seams
ITR	Independent technical review
joint	Natural fractures in rock generally vertical
JORC Code	*"Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code, 2004 Edition"*; prepared by The Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC)
km	Kilometre
LD core	Large diameter exploration boreholes from which samples of the strata are retrieved. The diameter of the core is generally 100 mm or more.
lithological	Description of the features of sedimentary rocks such as colour, grain size and composition
lithology	General description relating to the physical composition of rock forming materials
LOM	Life of mine
loose cubic metre	The volume in cubic metres of excavated materials after being disturbed; normally applied to materials in stockpiles, in haulage trucks and on conveyors

losses, geological	Ore lost due to unpredictable geology
losses, mining	Ore lost due to inefficiency in mining operations
m	Metre
magnetic survey	A geophysical technique that measures the earth's magnetic field and its changes
MBGS	McElroy Bryan Geology Services, geology consultants
mm	Millimetres
MMC	Minarco-MineConsult, a subsidiary of Runge Limited, mining consultants
moisture, air dried	Moisture in the analysis sample (as determined) or the residual moisture in equilibrium with the prevailing laboratory conditions
moisture, as received	Moisture determined on the as-received coal.
moisture, bed	In situ moisture; natural moisture content of the coal in the seam, that exists as an integral part of the coal seam in its natural state.
moisture, equilibrium	Moisture in a coal sample after attaining equilibrium at a temperature of 30 °C and a humidity of 97 % (by mass fraction).
moisture, free	Moisture that is lost by the coal in the course of attaining approximate equilibrium with the atmosphere to which it is exposed.
moisture, inherent	Moisture that exists as part of the coal seam in its natural state. In the case of most coals, the inherent moisture may be equated to the bed moisture and to the total moisture. In South Africa however, the term inherent moisture generally refers to the moisture in the analysis sample or the residual moisture.
moisture, in situ	Bed moisture; natural moisture content of the coal in situ in the seam, that exists as an integral part of the coal seam in its natural state.
moisture, residual	Moisture content that remains in the coal after it has been air-dried at room temperature and that can be removed by heating at 105 °C.
moisture, surface	The difference between total moisture and residual moisture.
Mbcm	million bank cubic metres
Mbcmpa	million bank cubic metres per year
Mt	million metric tonnes
Mtpa	million metric tonnes per year
MUS$	million US dollars
MW	mega (million) watts
Mylec	AB Mylec, coal quality/processing consultants

outcrop	An exposure of strata projecting through the overlying cover of detritus and soil
overburden	Strata that lies above the coal seam
paleo	Ancient reference to past geological times
paleozoic	An era of geological time from about 570 to 225 million years ago
PCI	Pulverized Coal Injection
Permian	The period from 280 to 225 million years ago. It is sometimes considered part of the Carboniferous period. It is part of the Paleozoic era
ply	A layer of a coal seam of distinguishing properties formed from different plant and sediment material deposited separately
£	British pounds
Project	A coal deposit which is in the pre-operating phase of planning and/or development and may be brought into operation subject to feasibility and approvals processes
Quaternary	The period following the Tertiary extending to the present
reject	The material extracted from the ROM coal feed during cleaning
relative density (RD)	
Reserves, Probable	As per Chapter19, "*..those measured and/or indicated mineral resources which are not yet "proved" but of which detailed technical and economic studies have demonstrated that extraction can be justified at the time of the determination and under specific economic conditions;*"
Reserves, Proved	As per Chapter19, "*..those measured mineral resources of which detailed technical and economic studies have demonstrated that extraction can be justified at the time of the determination, and under specified economic conditions,*"
Resources, Indicated	As per Chapter19, "*..that portion of a mineral resource for which quantity and quality can only be estimated with a lower degree of certainty than for a measured mineral resource because the sites used for inspection, sampling and measurement are too widely or inappropriately spaced to enable the material or its continuity to be defined, or its grade throughout to be established.*"
Resources, Inferred	A third classification of Mineral Resources with lower confidence than both Measured Resources and Indicated Resources which is defined in many international mineral estimating codes; including both the JORC (Australian) and the SAMREC (South African) codes. Note that Inferred Resources are not mentioned in Chapter19.
Resources, Measured	As per Chapter19, "*..that portion of a mineral resource for which tonnage or volume can be calculated from outcrops, pits, trenches, drill-holes or mine workings, supported where appropriate by other exploration techniques. The sites for inspection, sampling and measurement must be so spaced that the geological character, size, shape, quality and mineral content will be established with a high degree of certainty;*"
Resources, Mineral	As per Chapter19, "*..include metallic and non-metallic ores, mineral concentrates, industrial minerals, construction aggregates, mineral oils, natural gases, hydrocarbons and solid fuels including coal;*"
ROM	Run-of-mine, which defines a state of material which has been mined but not yet processed

sandstone	A sedimentary rock comprising sand set in a matrix of silt or clay united by a cementing material. Contains 85%-90% quartz
seam	A stratum of coal
shaft	A vertical or inclined excavation, commonly from the surface, of limited size, and normally used for mining, drainage, ventilation, people access, and delivery of mined materials to the surface
specific energy	The heat of combustion of a unit quantity of coal; expressed in either British thermal units per pound (Btu/lb), kilocalories per kilogram (kcal/kg) or megajoules per kilogram (MJ/kg). See "*calorific value*".
strip ratio	The ratio (bcm/t) of volume of waste mined (in bcm) to weight of coal mined (in t) in an open cut mining operation
sub-basin	A regional low area within a wider basin structure
subcrop	A mineral occurrence, including coal seams and plies, which comes near the surface but is covered by a thin layer of non-mineral overburden
syncline	A line or axis towards which strata dip or slope down from both directions
t	metric tonnes
tailings	The waste material remaining from finely ground ore from which the valuable minerals have been extracted
t/bcm, t/cm	Metric tonnes per bcm, or per cm, usually a measure of density
TC	Total carbon
tectonic	Relates to the movement and structural features of the earth's crust
Tertiary	The period between about 65 million and 2 million years ago
TM	Total moisture
tpa	metric tonnes per year
tph	metric tonnes per hour
Triassic	The period from 225 to 190 million years ago. It is part of the Mesozoic era
TS	Total sulphur
tuff	A general term for consolidated material ejected from a volcanic vent
US$	United States dollars
wash plant	A process plant designed to size and clean ores to produce beneficiated ore with higher grade and/or predetermined sizes
waste	Rock that is not part of the coal seam

VALMIN Code	"*Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Reports, The VALMIN Code, 2005 Edition*", prepared by the VALMIN Committee, a joint committee of The Australasian Institute of Mining and Metallurgy, the Australian Institute of Geoscientists and the Mineral Industry Consultants Association with the participation of the Australian Securities and Investment Commission, the Australian Stock Exchange Limited, the Minerals Council of Australia, the Petroleum Exploration Society of Australia, the Securities Association of Australia and representatives from the Australian finance sector.



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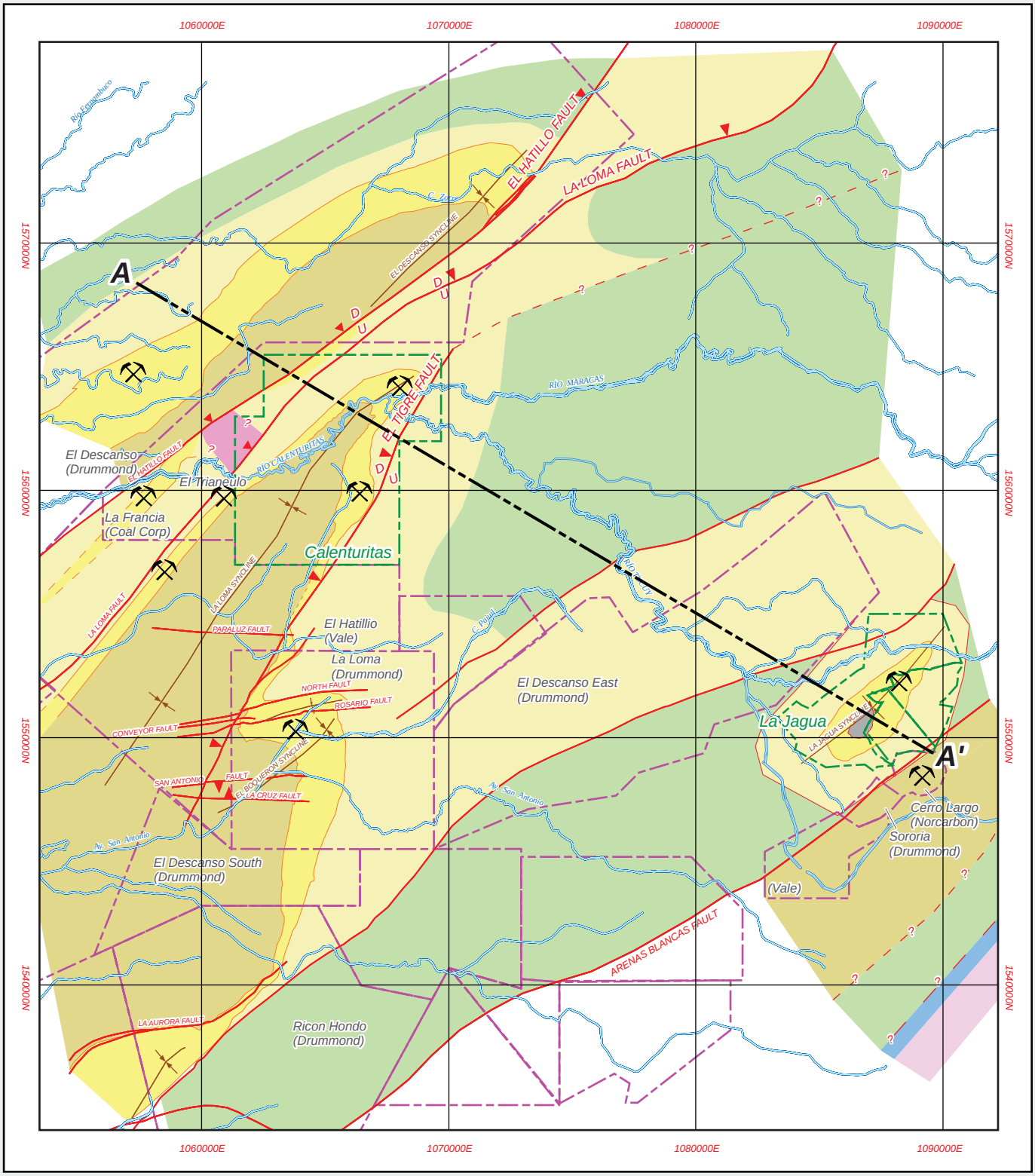
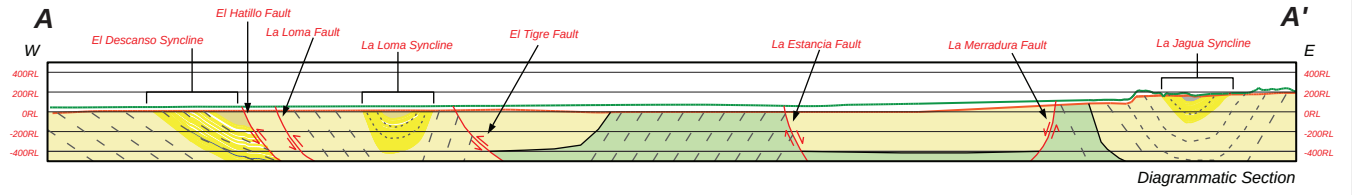
GENERAL LOCATION PLAN	
Date: May 2011	Job No: ADV-SY-03728 | Figure: 1





LEGEND

- Fault
- Syncline
- Anticline
- Subcrop
- Prodeco Leases
- Other Leases
- Rivers
- Current operations

Los Cuervos Fm / Barco Fm

- Colluvium
- Cuesta Formation
- Upper member
- Middle member Coal bearing unit
- Lower member
- Cretaceous undifferentiated
- Jurassic
- Paleozoic

0 2.5 5 10
kilometres

minarco mineconsult

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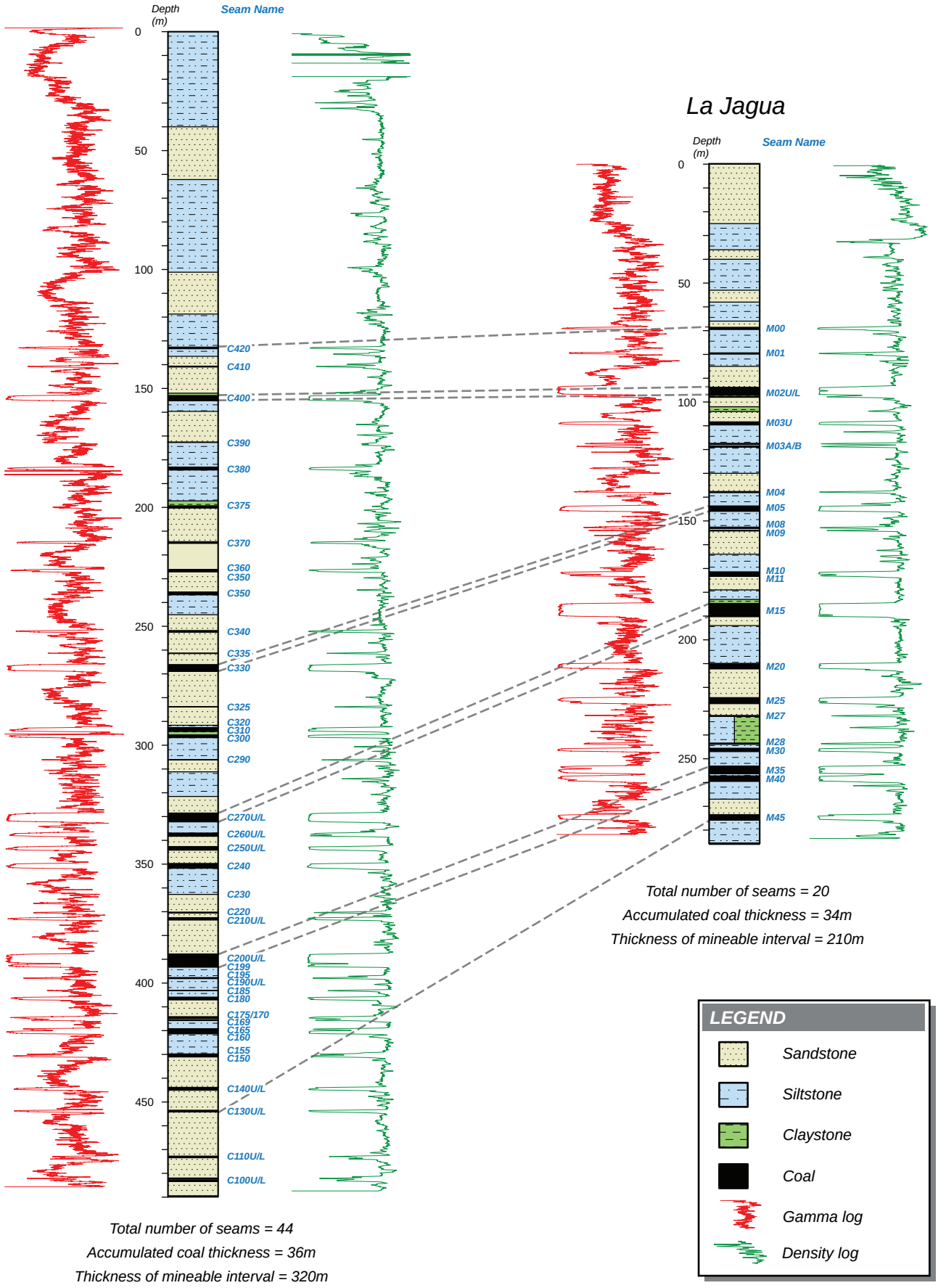
SOLID GEOLOGY - CESAR BASIN

Date: May 2011 | Job No: ADV-SY-03728 | Figure: 2



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STRATIGRAPHIC SECTIONS AND COAL SEAM CORRELATION

Date: May 2011 | Job No: ADV-SY-03728 | Figure: 3

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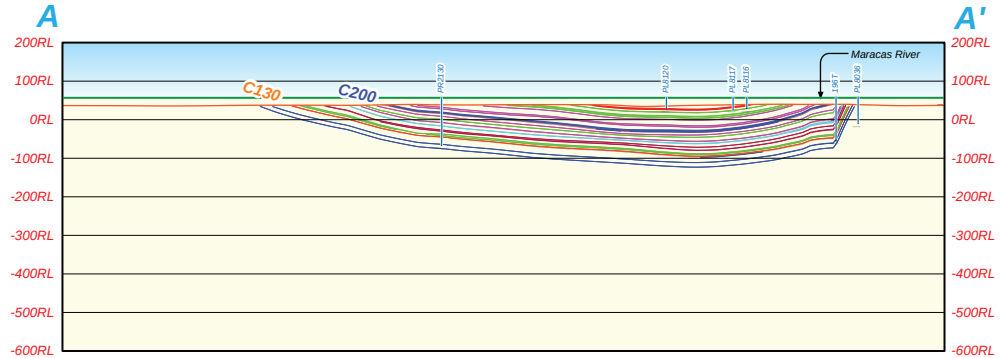

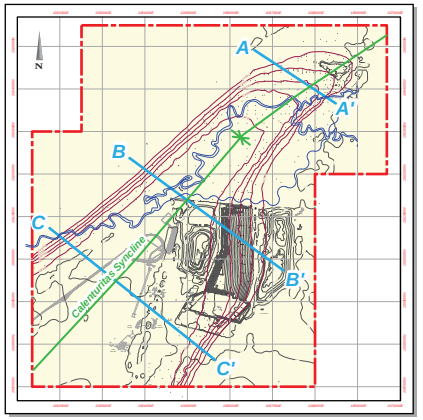

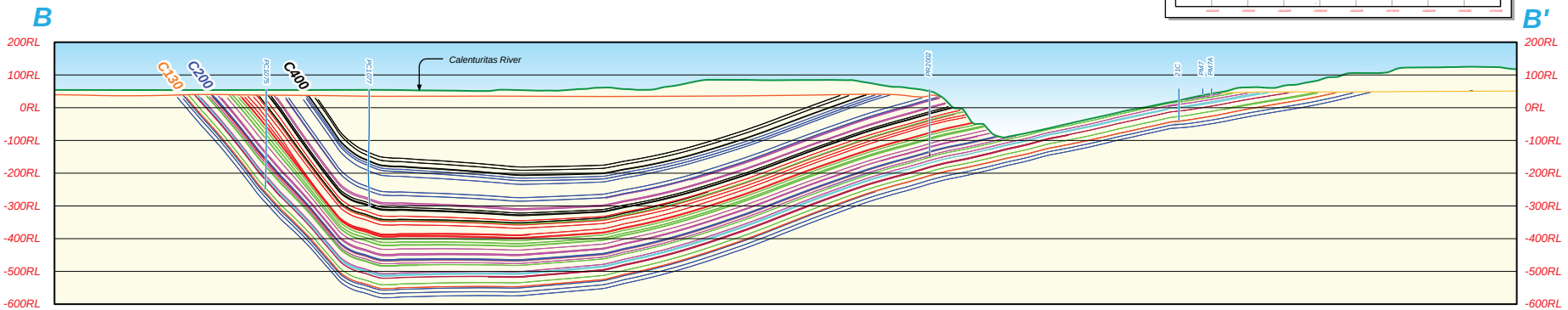

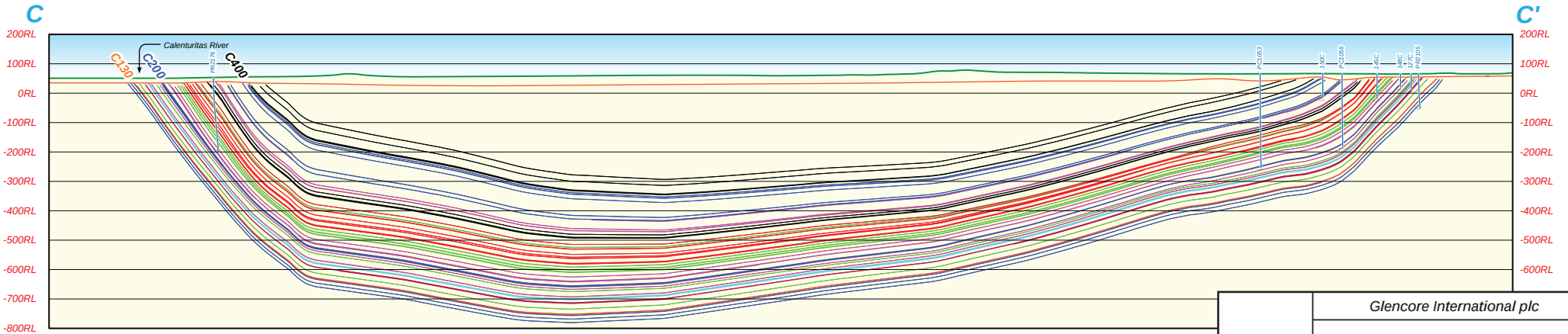

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CALENTURITAS GEOLOGICAL SECTIONS

Date: May 2011 | Job No: ADV-SY-03728 | Figure: 4

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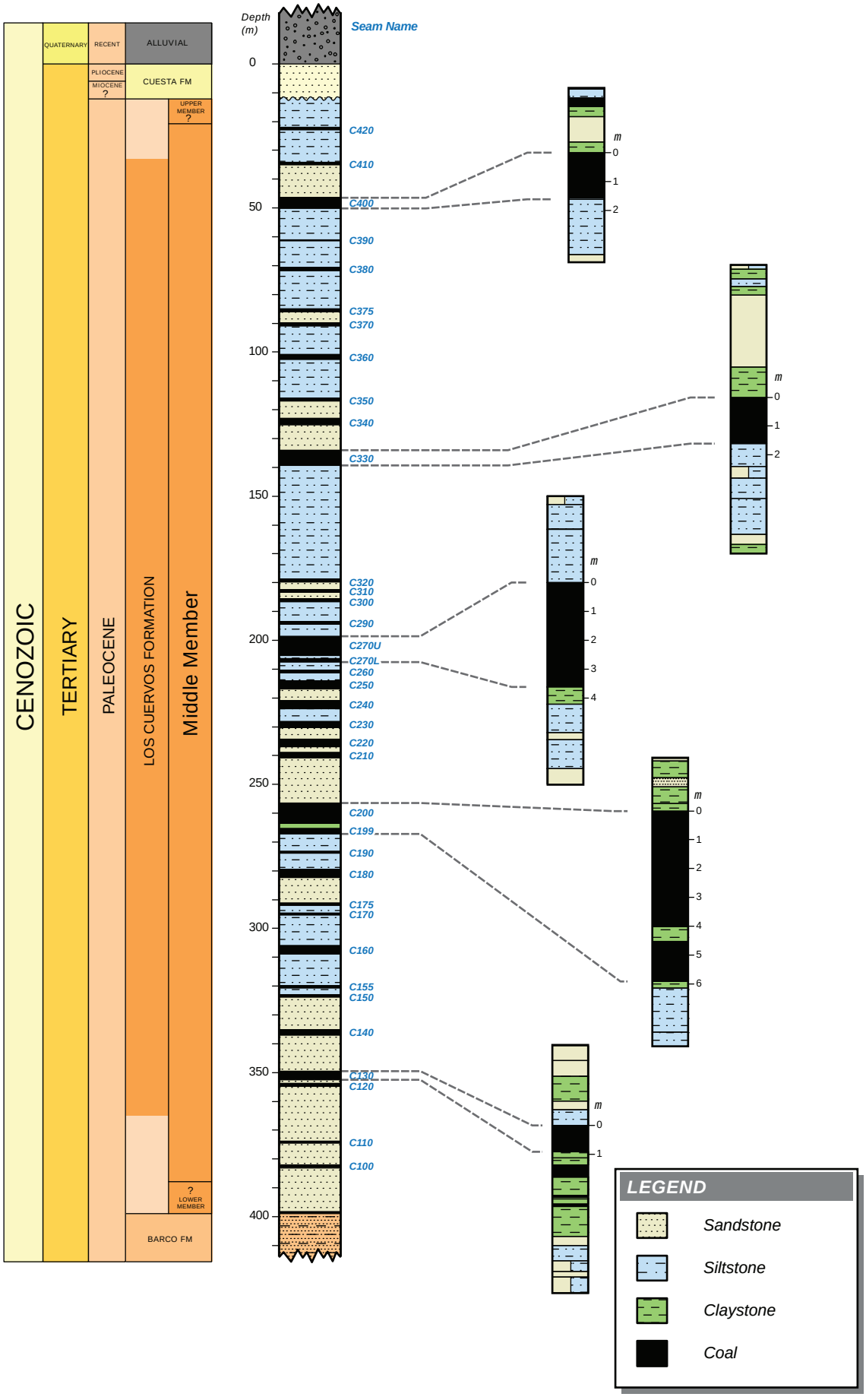

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CALENTURITAS DIAGRAMMATIC STRATIGRAPHIC SECTIONS

Date: May 2011	Job No: ADV-SY-03728	Figure: 5

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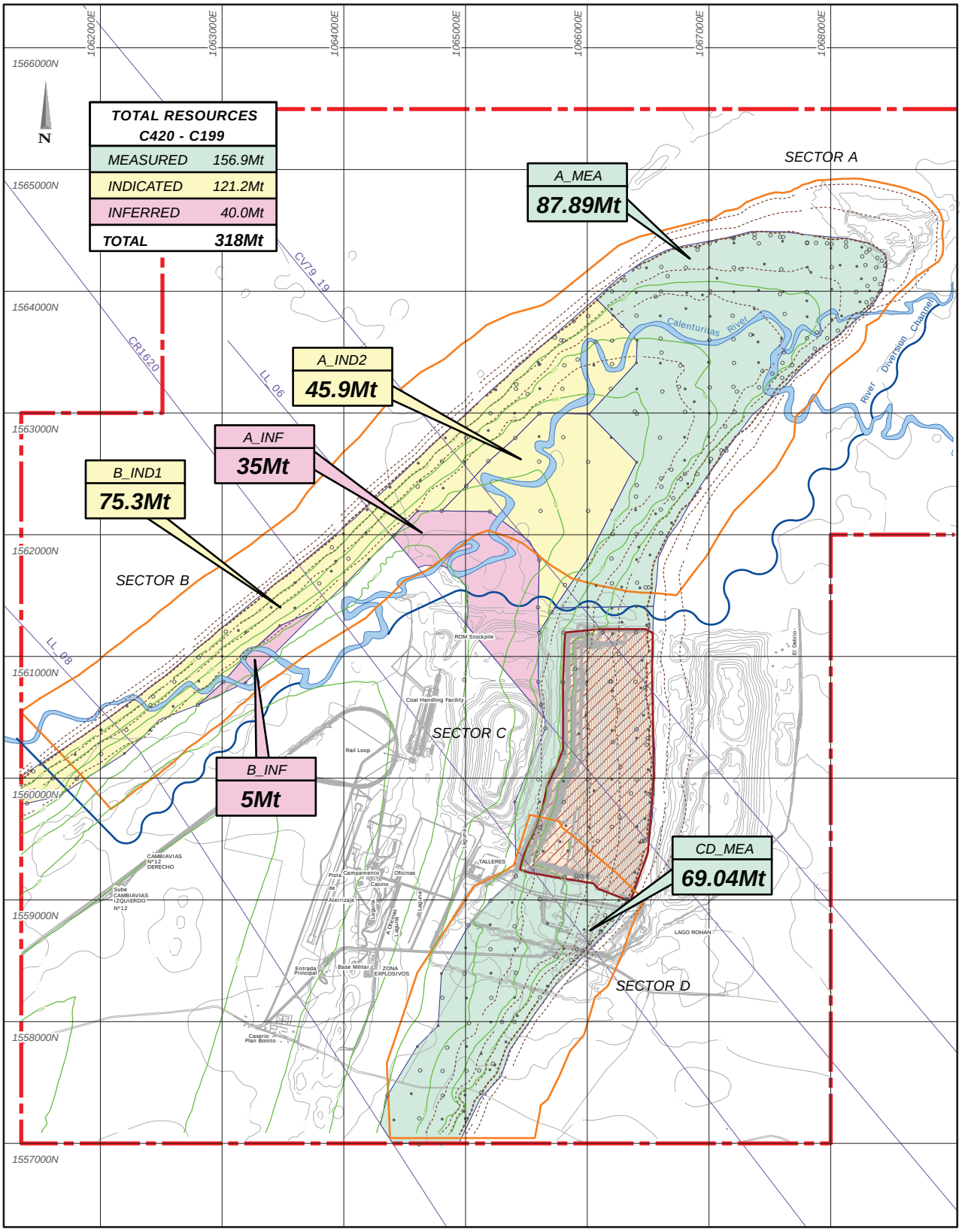

LEGEND

- Core hole
- Non core hole
- Seam subcrop
- Depth of cover to C130
- Mined Area
- LOM Pit Shell
- Seismic line
- River
- River diversion

Resources

- Measured
- Indicated
- Inferred

0 1 2km

kilometres

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CALENTURITAS COAL RESOURCE AREAS
C420 TO C199 SEAMS

Date: May 2011 | Job No: ADV-SY-03728 | Figure: 6

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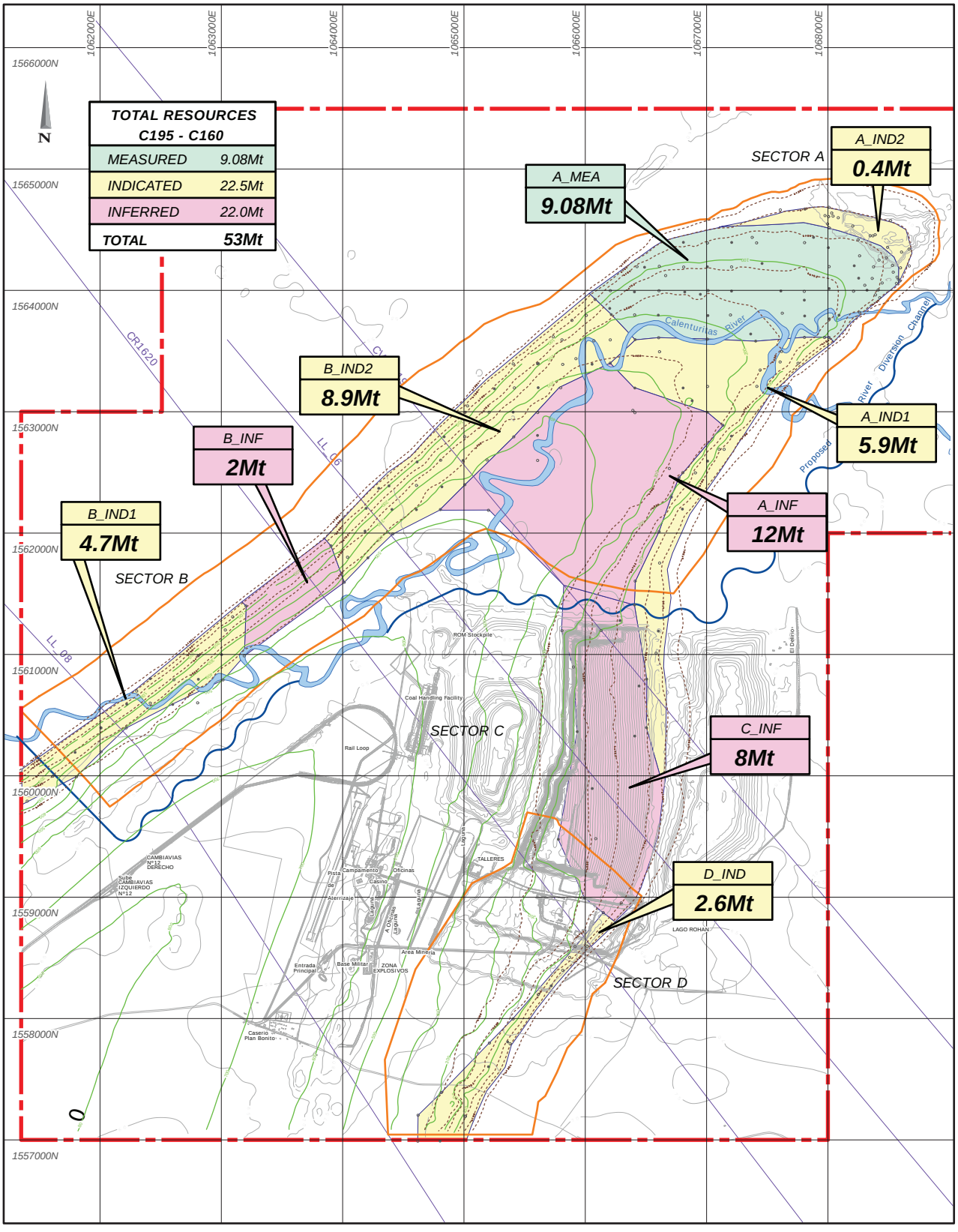

LEGEND

- Core hole
- Non core hole
- Seam subcrop
- Depth of cover to C130
- LOM Pit Shell
- Seismic line
- River
- River diversion

Resources

- Measured
- Indicated
- Inferred

0 1 2km

kilometres

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CALENTURITAS COAL RESOURCE AREAS C195 TO C160 SEAMS

Date: May 2011 | Job No: ADV-SY-03728 | Figure: 7

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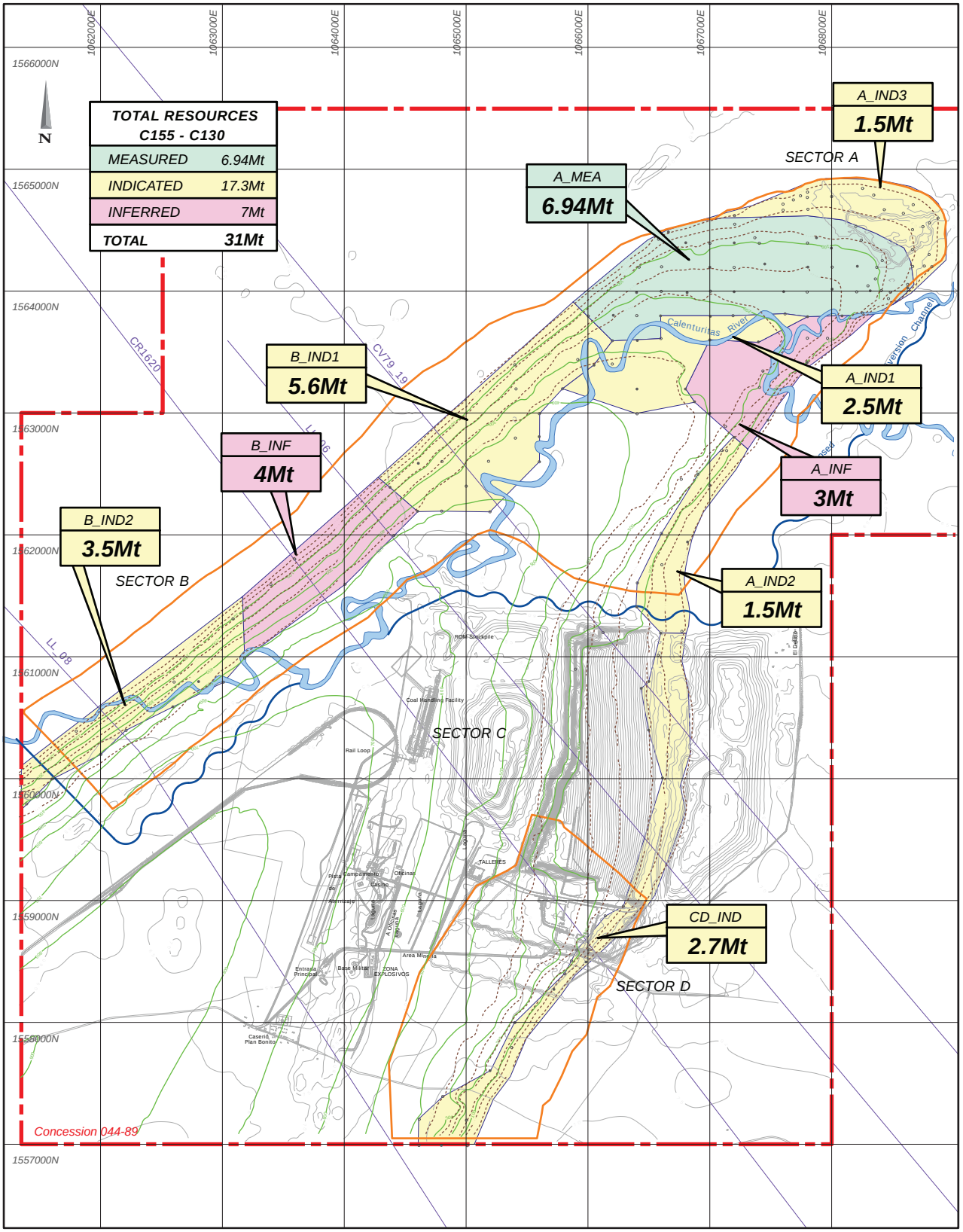
McElroy Bryan Geological Services



LEGEND

- Core hole
- Non core hole
- Seam subcrop
- Depth of cover to C130
- LOM Pit Shell
- Seismic line
- River
- River diversion

Resources

- Measured
- Indicated
- Inferred

0 1 2km

kilometres

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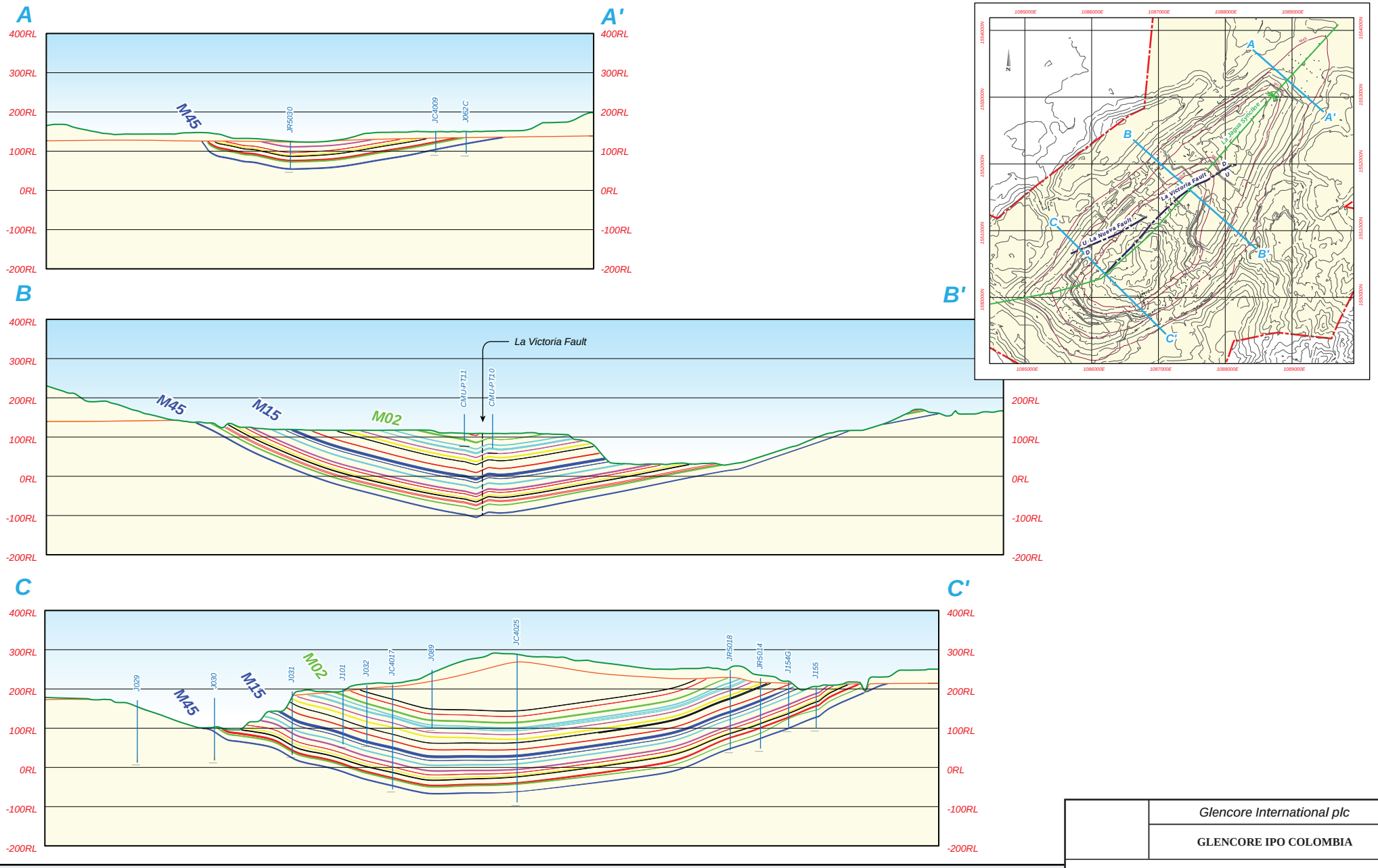
CALENTURITAS COAL RESOURCE AREAS C155 TO C130 SEAMS

Date: May 2011 | Job No: ADV-SY-03728 | Figure: 8



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	LA JAGUA GEOLOGICAL SECTIONS
Date: May 2011	Job No: ADV-SY-03728 / Figure: 9

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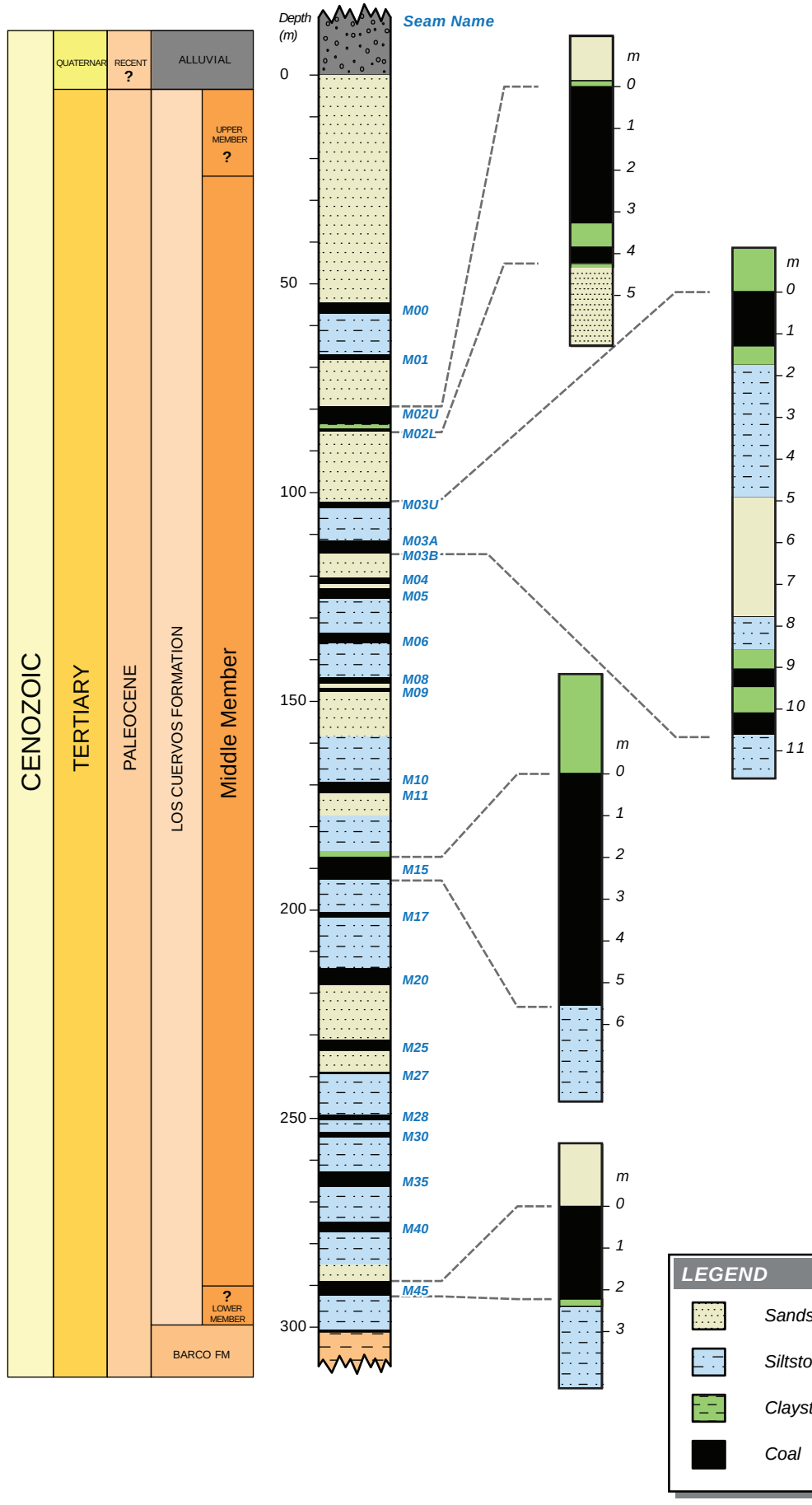

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LA JAGUA DIAGRAMMATIC STRATIGRAPHIC SECTIONS

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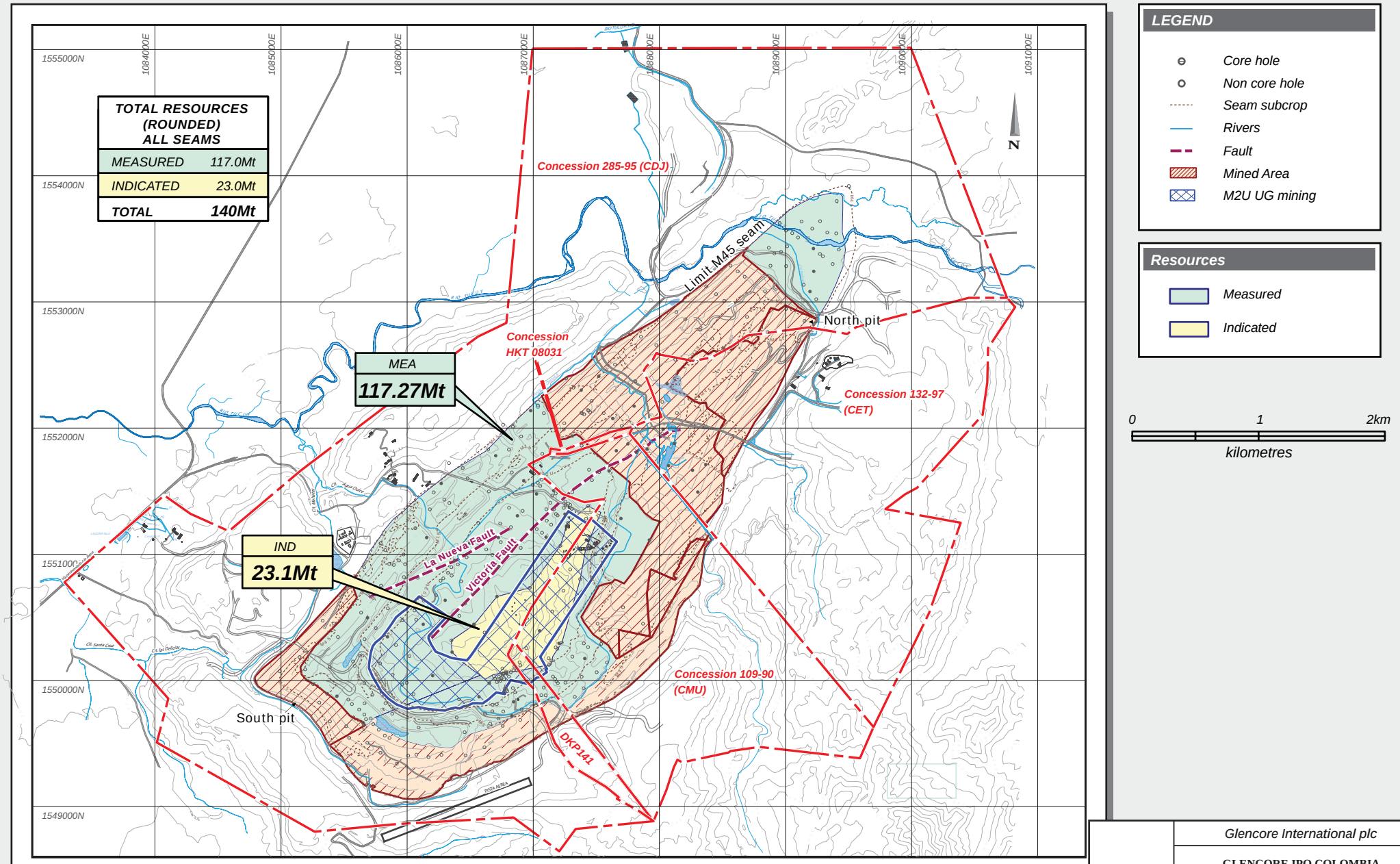

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LA JAGUA COAL RESOURCE AREAS

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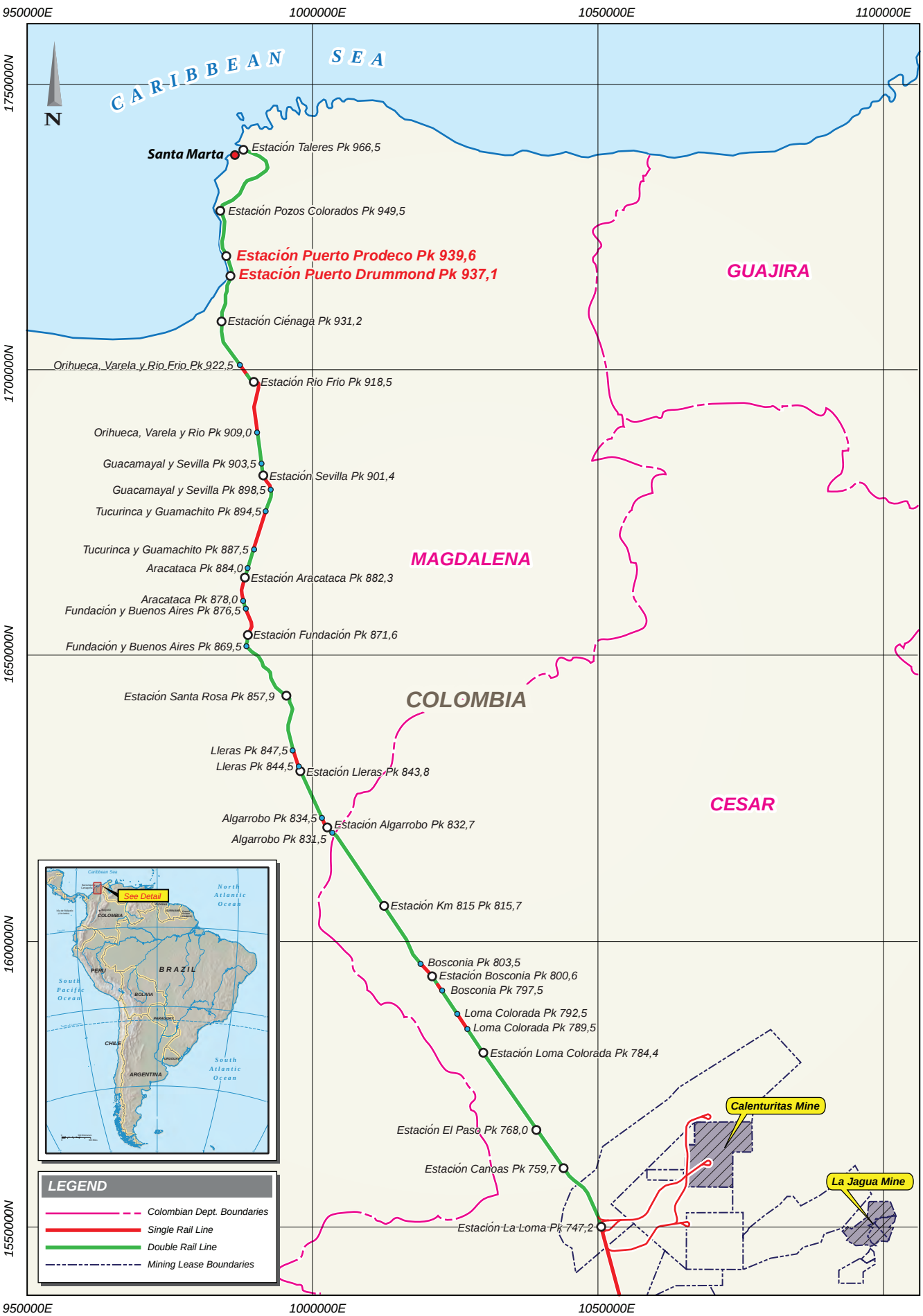

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COAL TRANSPORT RAIL LINE	
Date: May 2011	Job No: ADV-SY-03728 Figure: 12