

**TECHNICAL REPORT**

On the

**WESTCHESTER EXPANSION and WESTCHESTER MINE**

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### **3 SUMMARY**

#### **3.1 Introduction**

In August, 2012 Cobalt Coal Ltd. ("Cobalt") commissioned the author to prepare a CIM NI 43-101 compliant Technical Report with specific focus on a resource update for its Westchester Expansion Lease ("WEL") and its Westchester Mine, Alawest I and II ("WM") Coal Leases.

The WEL and WM leases cover coal-bearing strata of the Sewell Seam near the town of Welch and immediately northwest of Roderfield across the Tug Fork River in McDowell County, West Virginia, USA (Figure 3-1).

The WEL is a 121acre, NE-SW elongate, rectangular section of a much larger mining property owned by the Riverside Energy Company, LLC, ("Riverside") a West Virginia limited liability Company. The contiguous, 777.6 acre WM leases adjoin the southwest boundary of the WEL and are owned by ALAWEST INC. a Delaware Corporation. Cobalt currently holds a five (5) year term lease on the WEL with Riverside and an eight (8) year term lease with ALAWEST on the WM leases. The WEL is subject to a royalty of US\$ 4.00/t of clean coal mined and removed or 8% of the gross sales price. The WM leases are subject to royalties of US\$ 2.00/t of clean coal mined and removed or 7% of the gross sales price on Alawest I and US\$0.25/t of clean coal mined and removed on Alawest II.

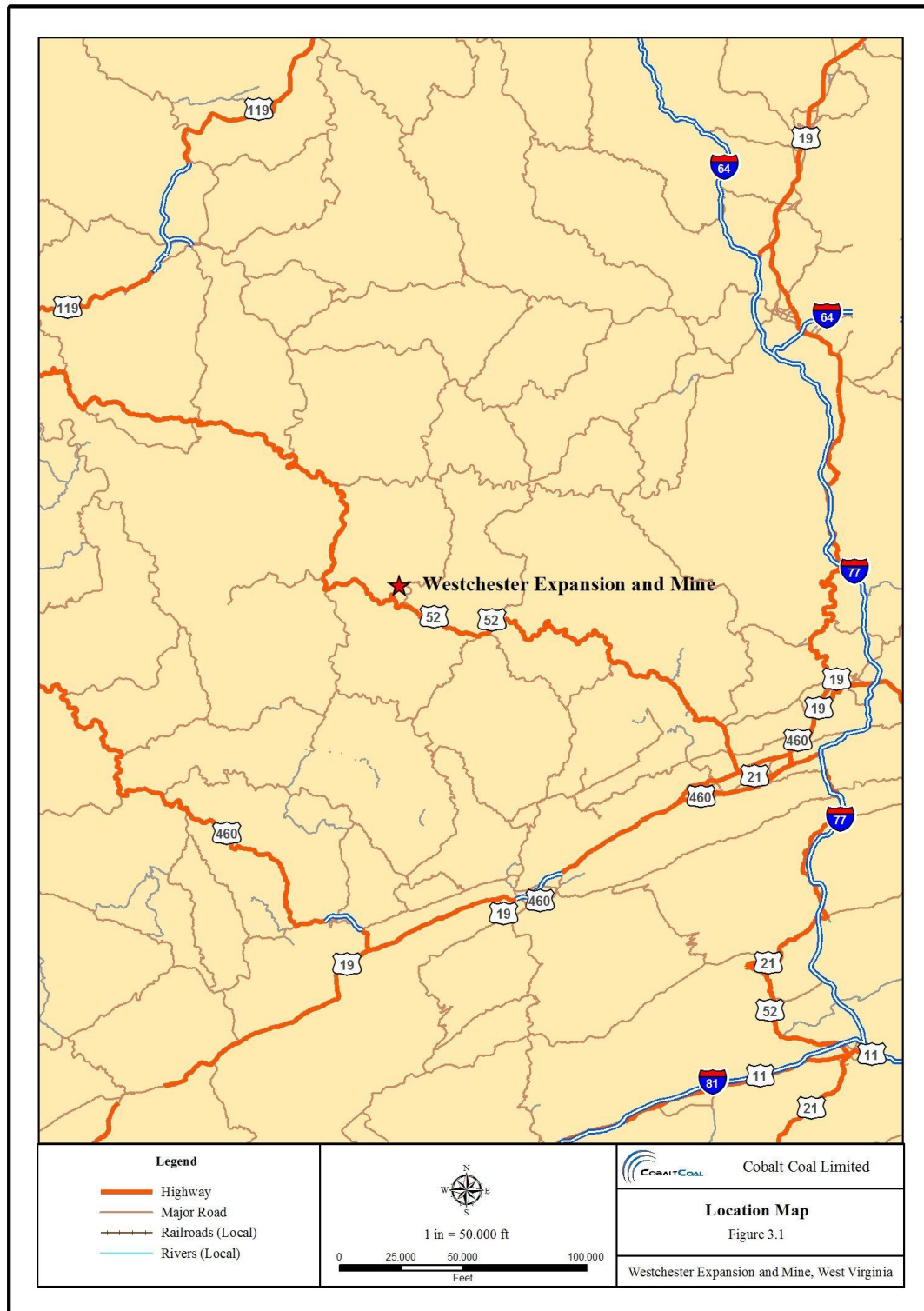
Cobalt is a public company listed on the TSX Venture Exchange (TSX-V) trading under the symbol CCF.

#### **3.2 History**

McDowell County has historically been the main source for metallurgical coal mined in the Eastern United States.

Mining and development of the coal seams in the New River Formation, including the Sewell Seam, started shortly after the Civil War around 1885. However, the first significant mining of this seam in the immediate vicinity of the WEL and WM coal leases is that recorded for the Hampton Roads Collieries Co. Inc. who developed a major mine within the WM coal leases. The mine records indicate that this mine was in operation at least from 1922 through 1927 but it may have been initially developed prior to this as early as 1908 under the name of the Hall and Barber Coal Co.

In the 1980's the Tug Huff Coal Corp. developed the Sewell No. 1 Mine from a portal site on the southeast side of the WM coal lease area. This mine was operated by the Virginia Crews Coal Company and continued in operation until 1988 when it was finally abandoned. The mine development was supported by a number of exploration boreholes, five of which were completed in the immediate area of the WEL and WM coal leases.



**Figure 3-1 Project Location Map**

All of the major coal companies progressively shut down their large mines as steel production in North America declined. The large mines were abandoned and most of the big processing plants were demolished. Today there are a few processing plants still operating, generally on a custom basis, and most of the raw coal is produced by independent mining contractors.

In June 2008 Cobalt developed the Westchester underground mine on its Alawest I Lease, which joins onto the southeast boundary of the WEL. Since commencement of production the company has produced and sold, to mid September 2012, 198,314 raw tons of coal of which about 72,882 tons are clean coal and at the time of the authors visit was operating at about 3,200 tons/month.

### **3.3 Geology and Stratigraphy**

West Virginia's commercially important Pennsylvanian age coalfields are located within the Central Appalachian basin of the eastern United States. The main coalfields are located in the Appalachian Plateau Province, an area of generally sub-horizontal seams with minor structural deformation and fold relief of less than 150 m. The coal bearing unit in the West Virginia area is the Lower Pennsylvanian age Pottsville Group which contains numerous low to high quality bituminous coal seams, many of which are targets for extraction and use as metallurgical coal.

The WEL and WM coal leases are located in the Southern Coalfield of West Virginia, an area that has a long history of intensive coal exploration and development. The coal seams of this area are some of the most well known brand names in the world's coal mining industry. These include the very famous Pocahontas Seams, most of which underlie the Sewell Seam, the resource target on the WEL and WM coal leases. The Sewell Seam is also well known in the coal industry being referred to in the past as "Blue River Smokeless Coal".

Regionally the Sewell Seam averages 1.2 to 1.5 m in thickness. Due to its high quality and market demand, Sewell Seam coal has been extensively mined. Historically the importance of this seam to the coal mining industry is shown by the fact that in 1988 Sewell Seam coal ranked twelfth in the State in coal production. At this time the Sewell Seams original resources represented about 5% of the State's total resource base.

The Sewell Seam on Cobalt's WEL and WM coal leases is generally sub-horizontal with an average westerly dip of 2% or less and shows little sign of structural disturbance. There are no known faults on the leases. On a detailed scale, as can be seen on the Westchester and old Sewell and Hampton mine maps, "rolls" occur locally in the floor of the seam. In most mines such structures are not tectonic features. They are usually the result of irregular erosion of the surface on which the original peat accumulated prior to its lithification to form coal. Such structures usually are of low amplitude but they can be abrupt.

### **3.4 Deposit Type**

The definition of “Deposit Type” for coal properties is different from that applied to other types of mineral deposits. The criteria applied to coal deposits for the purposes of determining coal resources and reserves include both a “Geology Type” and a “Deposit Type”. For coal deposits these are important concepts since the classification of a coal deposit as a particular type determines the range of limiting criteria that may be applied during the estimation of reserves and resources.

The Sewell Seam on the WEL and WM coal leases is flat lying to very gently dipping (0° to 2°) and is generally not faulted, although small-displacement normal faults and compaction related faults may occur. These characteristics suggest that the WEL and WM lease coal deposit should, according to GSC Paper 88-21, be categorized as “Low Type A” Geology Type to reflect the minimal geological complexity.

Deposit Type as defined in GSC Paper 88-21 refers to the extraction method most suited to the coal deposit. There are four categories, “surface”, “underground”, “non-conventional”, and “sterilized”. The Sewell Seam on the WEL and WM coal leases is an underground mineable deposit.

### **3.5 Mineralization**

For coal deposits, “mineralization” refers to coal development, coal seam thickness and stratigraphy. The formation of ‘coal measures’ is influenced by regional tectonics, changing climatic conditions and changes in foreland basin capacity. Facies distribution in the Southern Coalfield of West Virginia was controlled by the continual formation, abandonment and shifting of numerous small to large prograding delta systems within a differentially subsiding foreland basin. Major stratigraphic changes in the occurrence and quality of Appalachian coal beds are controlled by paleo-climatic conditions and eustatic sea-level changes. The low-sulfur, low-ash, coal beds of the Lower and Middle Pennsylvanian in West Virginia’s Southern Coalfield result from peat formation in domed peat deposits in a tropical ever-wet climate.

On a regional basis, the Sewell Seam averages 1.2 m to 1.5 m thick but locally attains up to 6.7 m thickness. In the drill holes and mining records of the WEL, WM, Sewell No.1 and Hampton Roads Mines in the area of this report, the net coal thickness ranges from 22” (55.9 cm) to 40.5” (102.9 cm) and average 33” (83.8 cm). The Sewell Seam locally splits or is “double benched” i.e. a rock band is locally found within the seam. The Westchester Mine and the core holes on the lease boundaries provide examples of the thickness of rock contained in this section of the seam. Based on fifty five measurements from drilling and mine records, internal rock thickness varies from 0” to 4.8” (12.2 cm) and average 0.6” (1.5 cm). It is expected that this internal rock thickness range will be typical throughout the resource area covered by this report.

### **3.6 Exploration and Drilling**

During 1980 and 1982 the Virginia Crews Coal Company drilled five exploration holes; KT-80-01, KT-80-02, KT-80-03, HM-82-01 and HM-82-05, in and adjacent to the WEL and WM coal leases. The Virginia Crews exploration map also shows the presence of three points on the outcrop of the seam, west and south of the Sewell No. 1 Mine and one on the outcrop close to the portal of the Westchester Mine.

Most of the exploration that has been completed on or adjacent to the WEL and WM coal leases however has been performed in conjunction with the 2008-2012 mining operations at Cobalt's Westchester Mine and the northwest sectors of the abandoned Sewell No.1 and Hampton Roads underground mine. The exploration data available from these sources is extensive and includes one hundred and nine structure points and eighty six seam thickness measurement points for the Sewell Seam. This data was integrated to produce structure contour and net coal isopach maps of the Sewell Seam on the WEL and the North Block of the WM coal leases.

The old mining maps do not directly provide data concerning coal quality. However, the fact that since starting production in 2008 the Westchester Mine has produced and sold 198,314 raw tons of metallurgical coal, attests to the commercial acceptance of the coal from the Sewell Seam on the WEL and WM coal leases.

### **3.7 Mineral Processing and Metallurgical Testing**

Based on the analytical data available, Sewell Seam coal, such as that found on the WEL and WM coal leases has an ASTM rank of Low to Medium Volatile Bituminous and can be utilized as a metallurgical coal in the steel industry.

Core samples from exploration drill holes KT-80-01, KT-80-02, KT-80-03, HM-82-01 and HM-82-05 in the WEL and WM coal leases area were analysed by different independent coal testing laboratories for an extensive suite of coal quality parameters. Details of the testing methods, types of analysis and testing laboratories are reviewed in sections 15 and 18.

The average values and significant ranges for the more important parameters from these tests are:

- The Dry basis clean coal Ash is 4.79%.
- The average Yield is 73.8%.
- The Ash Fusion Temperature is high.
- The Free Swelling Index ranges from 8.5 to 9.
- The volatile matter (VM cc DB) ranges from 19.78% to 20.74%.



### 3.8 Coal Resource Estimate

In-place net coal resources on the WEL and WM coal leases are summarized as follows;

| RESOURCE AREA            | DEPOSIT TYPE | ASTM GROUP                         | IN-PLACE COAL RESOURCES<br>(KTONS) |           |          |
|--------------------------|--------------|------------------------------------|------------------------------------|-----------|----------|
|                          |              |                                    | MEASURED                           | INDICATED | INFERRED |
| WESTCHESTER<br>EXPANSION | UNDERGROUND  | LOW-MED,<br>VOLATILE<br>BITUMINOUS | 625.2                              | 0         | 0        |
| NORTH BLOCK              | UNDERGROUND  | LOW-MED,<br>VOLATILE<br>BITUMINOUS | 208.2                              | 0         | 0        |
| SOUTH BLOCK              | UNDERGROUND  | LOW-MED,<br>VOLATILE<br>BITUMINOUS | 923.9                              | 0         | 0        |
| <b>TOTAL</b>             |              |                                    | <b>1,757.3</b>                     |           |          |

The WEL and the North Block resources have been adjusted for Cobalt's 2008-2012 production. These resources address only the Sewell Seam, the resource target on the WEL and WM leases. There may be other coal resource tonnages in several other seams but these are not addressed in this report. The practices of GSC 88-21 specify that resources be reported inclusive of the coal reserves based on the idea that reserves are simply a special class of resources.

### 3.9 Interpretation and Conclusions

The Cobalt Coal Limited's WEL and WM leases cover the Sewell Coal Seam, which demonstrates lateral stratigraphic continuity with thickness variations that are caused only by local stratigraphic changes and associated differential compaction. Tectonic deformation in this area is slight and thus the structural geology of the lease area is very simple consisting of flat-lying un-faulted beds. As a result, the geology type can be classified as Low Type A according to guidelines set forth in Geological Survey of Canada Paper 88-21.

The density of drilling, current and past mining activity in and adjacent to this lease is considered by the author to be adequate for the delineation of measured resources amenable to underground mining. There are three areas of coal resources underlying the WEL and WM leases which, as of September 27, 2012, total 1,757,300 tons.

Inconsistencies, in the 2009 Norwest Technical Report, economic changes since the study was done, Cobalt's current mining costs and lack of profitability to date, permits which allow Cobalt to

mine within 50' of old workings and the new geological model for the North Block resource derived from Cobalt's recent mining in this area, lead the author to conclude that no coal reserves can confidently be stated for any of the WEL or WM resource areas at this time.

### **3.10 Recommendations**

Considering the increased risk of mining without a valid, current economic analysis and coal reserve estimate the author strongly recommends that as the next phase of work Cobalt commission a new economic and mining study of both the WEL and WM leases to allow quantification of coal reserves. The author also recommends that Cobalt, during any future mining it may undertake, regularly reviews coal seam data, performs geotechnical testing and updates the geological database and model as required.

The cost of these recommendations is estimated to be US\$ 70,400.

## **4 INTRODUCTION**

In August, 2012 Cobalt Coal Ltd. ("Cobalt"), a Calgary, Alberta, Canada based public company listed on the TSX Venture Exchange (the "TSX-V"), commissioned the author to prepare a CIM NI 43-101 compliant Technical Report with specific reference to a resource update on its Westchester Expansion Lease (WEL) and its Westchester Mine (WM), Alawest I and II Leases. These three contiguous coal leases, totaling 898.6 acres, are located near the town of Welch in West Virginia, USA.

The WEL is a 121acre, NE-SW elongate, rectangular section of a much larger mining property owned by the Riverside Energy Company, LLC, ("Riverside") a West Virginia limited liability Company. The contiguous, 777.6 acre WM leases adjoin the southwest boundary of the WEL and are owned by ALAWEST INC. a Delaware Corporation. Cobalt currently holds a five (5) year term lease on the WEL with Riverside and an eight (8) year term lease with ALAWEST on the WM leases. The WEL is subject to a royalty of US\$ 4.00/t of clean coal mined and removed or 8% of the gross sales price, or whichever is greater. The WM leases are subject to royalties of US\$ 2.00/t of clean coal mined and removed or 7% of the gross sales price, or whichever is greater on Alawest I and US\$0.25/t of clean coal mined and removed on Alawest II.

The author's visit to the property 22-24 August 2012, information provided to the author by Cobalt during and subsequent to this visit, a prior NI 43-101 Technical Report prepared June 8, 2009 by Geoff Jordan, P. Geo. prepared for Cobalt Blue Resources Inc on the Westchester Mine, various private and government maps and reports on the area in the public domain and GSC Paper 88-21 are the bases on which the current report entitled Technical Report on the Westchester

Expansion Lease and Westchester Mine, Davy Quadrangle, Browns Creek District, McDowell County, West Virginia, USA was prepared.

The confirmation of documented geology and coal development and the verification of coal resources for the WEL and WM coal leases were completed through; data reviews, geologic modeling, mine and topographic survey, drill hole and coal quality verifications and a site visit.

During the author's site visit on August 22-24 the underground workings of the Westchester Mine on both the WEL and WM leases were examined and a representative selection of structural and seam data points verified and mining method confirmed. Active mine plans were reviewed, several surface outcrops referred to in this report verified and discussions held with mine staff with regards to seam and host rock conditions, production rates and production schedules.

## **5 RELIANCE ON OTHER EXPERTS**

The author's opinions contained herein and effective September 27, 2012, are based on various private and government maps and reports reviewed by the author throughout the course of the author's investigations, which in turn reflect various technical and economic conditions at the time of writing.

The author is not an insider, associate or an affiliate of Cobalt. The results of the technical review by the author are not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

The author has not researched the ownership information of the WEL and WM coal leases because of the complexity of these leasehold agreements and because they apply to privately owned lands but has relied upon a report and an opinions concerning its validity prepared by Cobalt's lawyers Jackson Kelly of Charleston, USA. The author has examined the lease agreement and the opinions of Jackson Kelly but is not, independently, able to express any opinion concerning the validity of the title or these documents.

The prior NI 43-101 technical report prepared June 8, 2009 by Geoff Jordan, P. Geo. for Cobalt Blue Resources on the Westchester Mine was relied upon for information pertaining to the history of the property and local area prior to Cobalt's acquisition and exploration programs.

The author has relied on the mine plans of the active Westchester Mine and adjacent Hampton Roads Colliery and Sewell #1 provided by Empire Consulting Services, LLC, West Logan, West Virginia, a state registered mining engineering service company, for the detailed structure and seam thickness information used in the preparation of the geological model and the classification and reporting of coal resources in the WEL and WM coal leases. During the authors site visit a representative selection of the data points indicated on these maps were visited and

verified underground in the Westchester Mine workings in both the WEL and WM leases.

The opinions expressed in this Report have been based on the various sources of information mentioned above. The author has exercised all due care in reviewing and verifying this information. The opinions in this Report are provided in response to a specific request from Cobalt to do so. Opinions presented in this Report apply to the site conditions and features as they existed at the time of the author's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which the author had no prior knowledge nor had the opportunity to evaluate.

## **6 PROPERTY DESCRIPTIONS AND LOCATION**

The property consists of three contiguous coal leases; Westchester Expansion (WEL), Alawest I and Alawest II (WM), totalling 898.6 acres and include Cobalt's Westchester Coal Mine in West Virginia, USA. These leases cover coal-bearing strata of the Sewell Seam near the town of Welch, West Virginia. The property is located immediately northwest of Roderfield across the Tug Fork River in McDowell County (Figure 6-1). Its central coordinates are: Latitude: 37° 28' N, Longitude: 81° 43' W.

### **6.1 Claims and Ownership**

The WEL is a 121acre, NE-SW elongate, rectangular section of a much larger mining property owned by the Riverside Energy Company, LLC, a West Virginia limited liability Company with whom Cobalt holds a five (5) year term lease agreement signed in January 2011. The contiguous; 777.6 acre WM leases adjoin the southwest boundary of the WEL and are owned by ALAWEST INC., a Delaware corporation with whom Cobalt holds an eight (8) year term lease agreement signed in August 2011.

### **6.2 Lease Status**

The author has not researched the ownership information of the WEL and WM coal leases because of the complexity of these leasehold agreements and because they apply to privately owned lands but has relied upon a report and an opinions concerning its validity prepared by Cobalt's lawyers Jackson Kelly of Charleston, USA. The author has examined the lease agreements and the opinions of Jackson Kelly but is not, independently, able to express any opinion concerning the validity of the title or these documents.

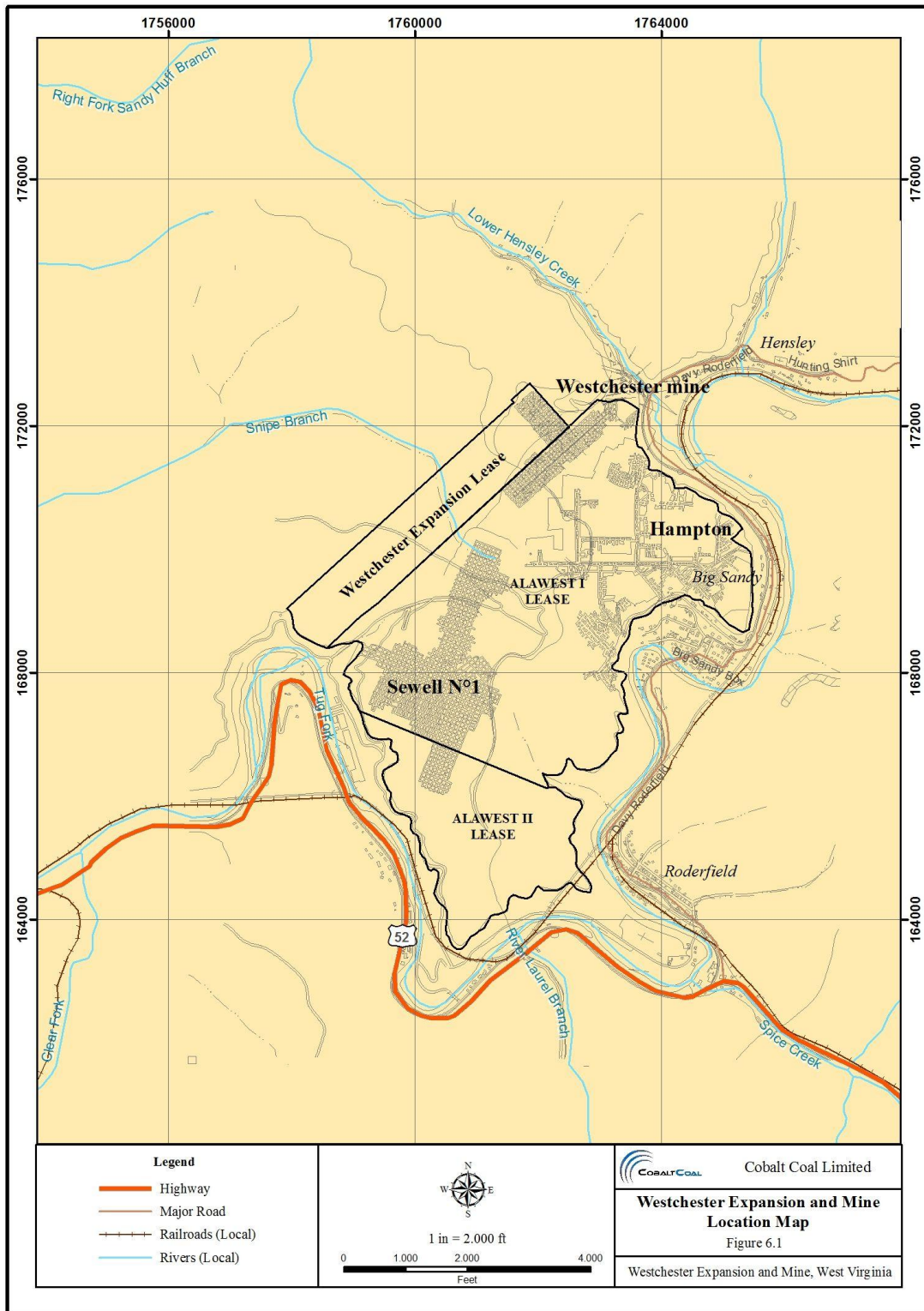


Figure 6-1 Westchester Expansion and Mine Leases Location Map

### **6.3 Underlying Agreements**

Cobalt's current WEL and WM Lease Agreements with Riverside and ALAWEST assign Cobalt the "right of mining and removing coal by the deep or underground mining methods from the Sewell Seam of coal, in, on and under the property and the rights to mine, remove, transport, handle, store, process, clean, load, unload, and sell such coal" subject to royalties of; US\$ 4.00/t of coal mined and removed or 8% of the gross sales price on the WEL and US\$ 2.00/t of clean coal mined and removed or 7% of the gross sales price on Alawest I and US\$0.25/t of clean coal mined and removed on Alawest II. Cobalt also must pay, as rental, an annual advance minimum royalty of US\$ 25,000 on the WEL and US\$ 5,100 on the WM leases. In addition Cobalt has the right to "transport coal mined from other lands over, under or through the leaseholds" subject to a wheelage royalty of "US\$ 0.15/t or 0.25% of the gross sales price on the WEL, and of US\$ 0.65/t or 0.25% of gross sales price on the WM leases.

## **7 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE and PHYSIOGRAHY**

The WEL and WM coal leases lie immediately northwest of Roderfield, across the Tug Fork River, in McDowell County, West Virginia. Route 52 borders the southwest end of the lease and Route 7 passes close to the northeast end of the lease in the Hensley Creek watershed on Westchester Road. The Norfolk Southern Railroad also passes close to both the northeast and southwest ends of the lease. The nearest cities of any size are Beckley, West Virginia, 65 miles away and has an airport served by US Airways and Charleston, West Virginia, 110 miles away with a larger airport served by US Airways, United, Delta and Northwest. Rail service is provided by the Norfolk and Western Railway.

In winter the climate of McDowell County is cold and snowy with average temperatures of about 1-2°C. In the summer the climate is fairly warm with average temperatures of around 22°C. The total average annual precipitation is about 103 cm. Of this, 56 cm, or about 55%, usually falls in April through September. The average seasonal snowfall is about 48 cm. Normal annual precipitation is adequate for all crops.

The major industries of the county are coal mining and the development of forest products. Livestock and apple production are minor commercial enterprises in the county however; the apple orchards in the Bradshaw area are important to the local economy and provide produce to the surrounding area and other states. The nearest town is Welch which is the County Seat of McDowell County. The current population of Welch is about 10,000.

McDowell County is in the Cumberland Plateau and Mountain physiographic region. Its natural landforms are the result of erosion of this plateau to produce a multitude of narrow valleys. The topography of McDowell County is dominated by very steep mountain side slopes below gently sloping to very steep ridge tops. Narrow, nearly level and gently sloping flood plains occur along many of the streams. McDowell County is almost entirely drained by the Tug Fork River. The lowest elevation in the survey area is about 267 m (ASL) at the confluence of the Tug Fork River and Fourpole Creek in the extreme western part of McDowell County. The highest elevation is about 1,036 m on Flattop Mountain in the extreme eastern part of the county where it adjoins Mercer and Wyoming Counties.

## **8 HISTORY**

McDowell County has historically been the main source for metallurgical coal mined in the Eastern United States. Some of the larger past producers in the county were U.S. Steel Corp., L.T.V. Steel, Pocahontas Coal and Coke, Semmet Solvey, Allied Chemical Co. and Consolidated Coal and Coke. These companies locally employed tens of thousands of people throughout the 1960's.

Mining and development of the coal seams in the New River Formation, including the Sewell Seam, started shortly after the Civil War around 1885. However, the first significant mining of this seam in the immediate vicinity of the WEL and WM coal leases is that recorded for the Hampton Roads Collieries Co. Inc. who developed a major mine in the Sewell Seam in the northeast end of the WM coal leases and to the north of the town of Big Sandy on the west side of the Tug Fork River. The mine records indicate that this mine was in operation at least from 1922 through 1927 but it may have been initially developed prior to this under the name of the Hall and Barber Coal Co., as early as 1908. Other smaller mines were developed adjacent to the Hampton Roads Collieries Mine during the 1940's to 1960's period.

In the 1980's the Tug Huff Coal Corp developed the Sewell No. 1 Mine from a portal site on the southeast side of the WM coal leases. This mine was operated by the Virginia Crews Coal Company and continued in operation until 1988 when it was finally abandoned. The mine development was supported by exploration boreholes, five of which were completed in the immediate area of the WEL and WM coal leases.

All of the major coal companies progressively shut down the large mines as steel production in North America declined. The large mines were abandoned and most of the big processing plants were demolished. Today there are a few processing plants still operating, generally on a custom basis, and most of the raw coal is produced by independent mining contractors.

In early 2008 Cobalt Coal Corp Mining, Inc. ("Cobalt Mining") developed the Westchester underground mine on its Alawest I Lease which adjoins onto the southeast boundary of the Westchester Expansion Lease. In mid-2011 Cobalt Mining extracted coal from the northeast end of the Westchester Expansion Lease. Since commencement of production in June 2008, the company has produced and sold, to mid September 2012, 72,882 tons of clean coal of which about 25,310 tons came from the WEL and 47,572 tons came from the WM leases. The average recoveries were about 36.8% (Table 8.1).

**Table 8.1 Cobalt Mining 2008-2012 Production Statistics**

| <b>Dates</b>            | <b>Raw Tons</b> | <b>Clean Tons</b> | <b>Recovery</b> |
|-------------------------|-----------------|-------------------|-----------------|
| 2008, 2009              | 5,906           | 2,485             | 42.1%           |
| Jun 1-Dec 31, 2010      | 33,728          | 12,070            | 36.2%           |
| Jan 1-Dec 31, 2011      | 83,989          | 31,004            | 37.2%           |
| Jan 1-Sept 15, 2012     | 74,691          | 27,323            | 36.6%           |
| <b>Total Production</b> | <b>198,314</b>  | <b>72,882</b>     | <b>36.8%</b>    |

## **9 GEOLOGICAL SETTING**

### **9.1 Regional Geology and Stratigraphy**

West Virginia's commercially important Pennsylvanian Age coalfields are located within the Central Appalachian basin of the eastern United States (Figure 9-1). The main coalfields are located in the Appalachian Plateau Province, an area of generally sub-horizontal seams and minor structural deformation with fold relief of less than 150 m. The coal bearing unit in the West Virginia area is the Lower Pennsylvanian age Pottsville Group which contains numerous low to high quality bituminous coal seams, many of which are targets for extraction and use as metallurgical coal.

The WEL and WM coal leases are located in the Southern Coalfield of West Virginia, an area that has a long history of intensive coal exploration and development activity. The seams of this area are some of the most well known brand names in the world's coal mining industry. These include the very famous Pocahontas Seams, most of which are found in the formation that underlies the Sewell Seam, the resource target for the WEL and WM coal leases. The Sewell Seam is also well known in the coal industry being referred to in the past as "Blue River Smokeless Coal".



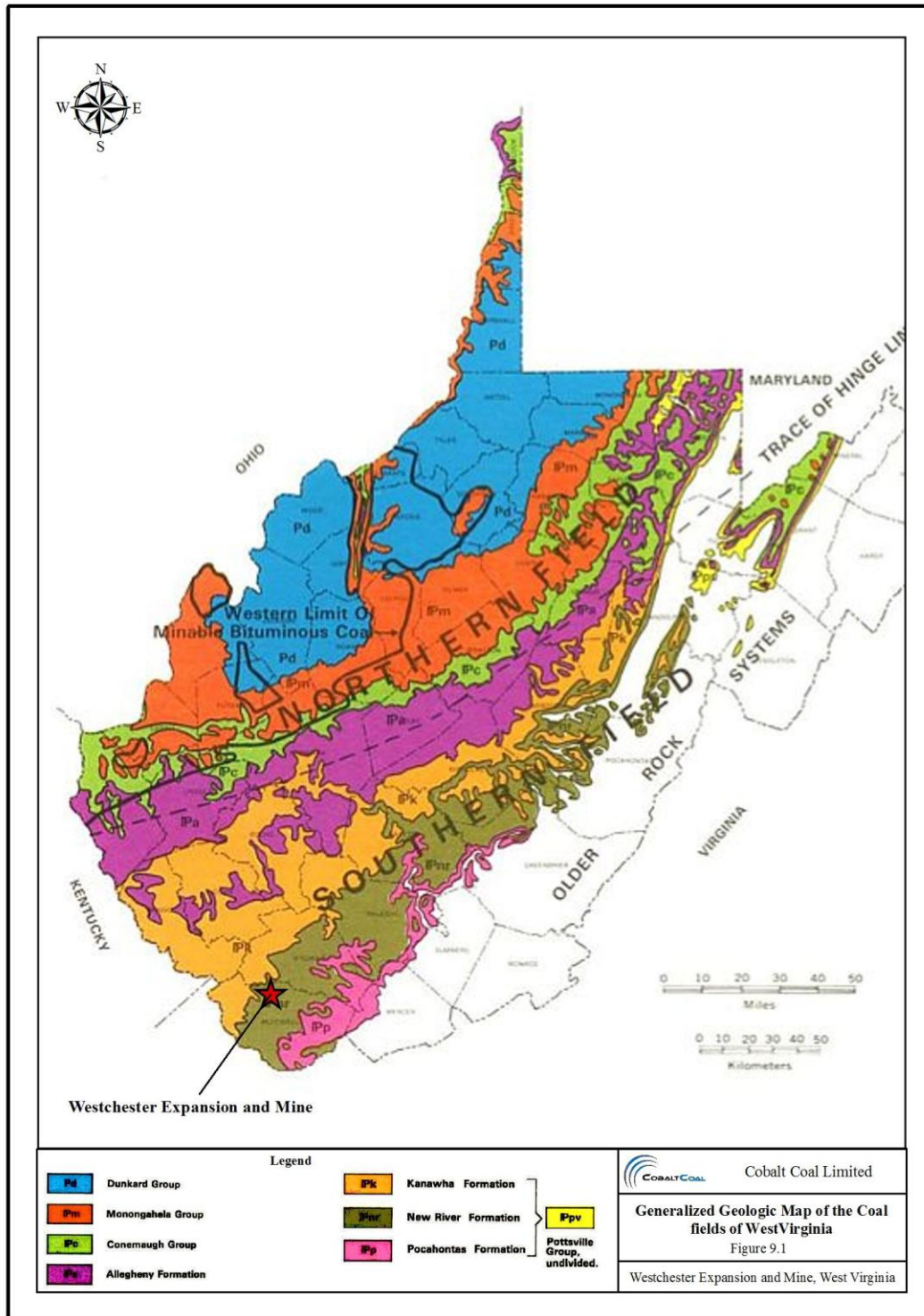


Figure 9-1 Generalized Geologic Map of the Coal Fields of West Virginia

The Lower and Middle Pennsylvanian Age strata of the Southern Coalfield are divided into three formations which are, in ascending order, Pocahontas, New River and Kanawha. The Pocahontas Formation, the oldest Pennsylvanian unit in West Virginia, extends upward from the top of the underlying Upper Mississippian Bluestone Formation to the base of the No. 8 Pocahontas coal bed (lowermost New River Formation). The Pocahontas Formation is a wedge of clastic sediments that thins to the northwest from a maximum thickness of approximately 215 m near the type locality in Virginia to about 25 m in south-central West Virginia, before being truncated by sediments of the overlying New River Formation in a regional unconformity. The valuable Pocahontas Formation coal beds, sequentially numbered from oldest to youngest, are low-volatile bituminous. Even though these coal beds exhibit the lenticular nature of most Pocahontas Formation units, extensive underground mining has occurred in the No. 3, 4 and 6 coal beds.

The Lower Pennsylvanian New River Formation includes all strata between the base of the No. 8 Pocahontas coal bed and the base of the Lower Douglas coal bed in the lowermost Kanawha Formation. The New River Formation unconformably overlies the Pocahontas Formation in southeastern West Virginia, where it also obtains its maximum thickness of over 305 m. To the west, north and northwest, New River Formation strata are lithic arenite dominated, deltaic sequences, inter-digitating with quartz arenite sequences. The New River strata thin towards the northwest and north and eventually terminate in the subsurface beneath Kanawha Formation strata. Commercially minable coal beds include the Fire Creek, Beckley and Sewell Seams.

The New River coal beds are low-medium-volatile bituminous in rank. Some, most notably the Beckley coal bed, are potentially important reservoirs of coal bed methane. The Sewell seam averages 1.2 to 1.5 m in thickness. Due to its high quality and market demand Sewell Seam coal has been extensively mined. Historically the importance of this seam to the coal mining industry is shown by the fact that in 1988 Sewell Seam coal ranked twelfth in the State in coal production. At this time the Sewell Seams original resources represented about 5% of the State's total resource base.

The Kanawha Formation extends upward from the base of the Lower Douglas coal bed and is punctuated by numerous marine transgressions. In areas where the Kanawha Black Flint is absent, the top of the Stockton coal bed is generally used as the upper formation contact. The Middle Pennsylvanian Kanawha Formation, over 610 m thick in the southeastern portion of its areal extent, thins to the northwest, where it is less than 185 m thick in the Kanawha River Valley. High quality, generally high-volatile, "A" coal beds of the Kanawha Formation of southern and south-central West Virginia have been extensively used for both steam and metallurgical applications.

## **9.2 Property Geology**

The Sewell Seam on Cobalt's WEL and WM coal leases is generally sub-horizontal with an average westerly dip of 2% or less and shows little sign of structural disturbance. The structural features are well displayed in the eastern and northern parts of the leases, as shown on the detailed maps of the Westchester, Sewell No.1 and Hampton Roads Collieries underground mining operations. There are no known faults on the leases. The structure of the Sewell Seam in the lease area is illustrated on Figure 9-2. The general strike of the seam is NE-SW however, as can be seen in Figure 9.2, a prominent NW-SE break disturbs this trend in the north half of the leases.

On a detailed scale, as can be seen on the Westchester, Sewell No.1 and Hampton Roads Collieries mine maps, "rolls" occur locally in the floor of the seam. In most mines such structures are not tectonic features. They are commonly the result of irregular erosion of the surface on which the original peat accumulated prior to its lithification to form coal and differential compaction of the organic material during and post lithification. Such structures usually are of low amplitude but they can be abrupt.

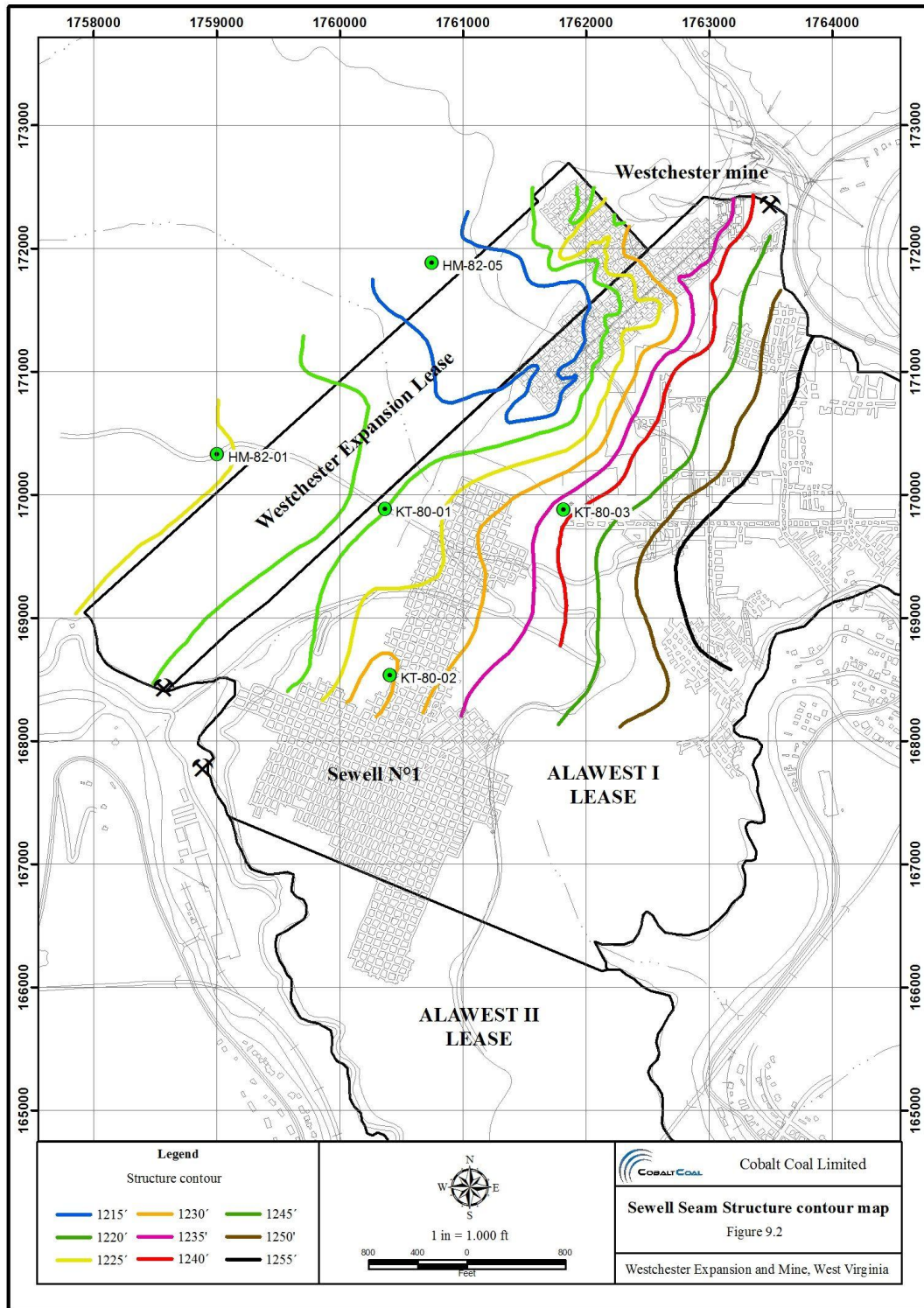


Figure 9-2 Sewell Seam Structure Contour Map

## 10 DEPOSIT TYPES

The definition of “Deposit Type” for coal properties is different from that applied to other types of mineral deposits. The criteria applied to coal deposits for the purposes of determination of coal resources and reserves include both a “Geology Type” and a “Deposit Type”. For coal deposits these are important concepts since the classification of a coal deposit as a particular type determines the range of limiting criteria that may be applied during the estimation of Reserves and Resources.

The Geology Type for coal deposits is a parameter defined Geological Survey of Canada (GSC) Paper 88-21; the reference for coal deposits as specified in NI 43-101, quantifies the amount of geological complexity, usually imposed by the structural complexity of the area, of the coal deposit. The classification of a coal deposit by Geology Type determines the approach to be used for the Resource or Reserve estimation and the limits to be applied to certain key estimation criteria. The identification of a particular Geology Type for a coal property also defines the confidence that can be placed in the extrapolation of data values away from a particular drill hole.

The classification scheme developed in GSC Paper 88-21 is similar to other international coal reserve classification systems with the exception that this system is designed to accommodate differences in the degree of tectonic deformation of different coal deposits. Four classes of Geology Type are provided for ranging from “low”, which is for essentially undisturbed coal deposits such as those of the Canadian Plains type to “severe” such as those for the Canadian Rocky Mountains.

The Sewell Seam on the WEL and WM coal leases is flat lying to very gently dipping (0° to 2°) and is generally unfaulted, although small displacement normal faults and compaction related faults may occur. These characteristics suggest that the WEL and WM lease coal deposit should, according to GSC Paper 88-21, be categorized as “Low Type A” Geology Type to reflect the minimal geological complexity.

Deposit Type as defined in GSC Paper 88-21 refers to the extraction method most suited to the coal deposit. There are four categories, “surface”, “underground”, “non-conventional”, and “sterilized”.

The Sewell Seam on the WEL and WM coal leases is an underground mineable deposit.

## 11 MINERALIZATION

For coal deposits, “mineralization” refers to coal development, coal seam thickness and stratigraphy. The formation of the ‘coal measures’ is influenced by regional tectonics, changing climatic conditions and changes in foreland basin capacity. Facies distribution in the Southern Coalfield of West Virginia was controlled by the continual formation, abandonment and shifting of numerous small to large prograding delta systems within a differentially subsiding foreland basin. During the Lower and Middle Pennsylvanian, sediments of the Pottsville Group were deposited in the more rapidly subsiding proximal portion of the eastern half of the basin.

Pennsylvanian Age coal beds exhibit a progressive gradation from the southeast to northwest from the geologically older, low-sulfur, low-ash higher-rank coal beds of the Southern Coalfield to the relatively younger, higher-sulfur, higher-ash, and lower-rank coal beds of the Northern Coalfield. Major stratigraphic changes in the occurrence and quality of Appalachian coal beds are controlled by paleo-climatic conditions and eustatic sea-level changes. The low-sulfur, low-ash coal beds of the Lower and Middle Pennsylvanian in West Virginia’s Southern Coalfield result from peat formation in domed peat deposits in a tropical ever-wet climate.

There are seven seams in the Pocahontas Formation of the Pottsville Group. These are referred to, in ascending order, as No.1 Pocahontas Seam, through No.7 Pocahontas Seam. The Pocahontas No.3 Seam is the most well known and, despite being lenticular has been extensively mined. This seam is not thick and only occasionally exceeds 3.0 m. It is, however, a regional stratigraphic marker bed.

The New River Formation that unconformably overlies the Pocahontas Formation includes seven seams, from the No. 8 Pocahontas Seam to the base of the Lower Douglas Seam. The latter seam is defined as being a unit of the Kanawha Formation. The most important seams of the New River Formation are the Fire Creek, Beckley and Sewell seams, the last of which is the resource target seam on the WEL and WM coal leases. On a regional basis, the Sewell Seam averages 1.2 m to 1.5 m thick but locally occurrences up to 6.7 m thick are known. In the drill holes and mining records of the WEL and WM coal leases, Westchester and Sewell No.1 Mines, the net coal thickness ranges from 22” (55.9 cm) to 40.5” (102.9 cm) and average 33” (83.8 cm). The net coal thickness for the Sewell Seam is illustrated on the isopach map, Figure 11-1.

The Sewell Seam in the WEL and WM coal lease area locally splits or is “double benched” i.e. a rock band is locally found in the seam. The Westchester Mine maps and the core holes on the lease boundaries provided examples of the thickness of rock contained in this section of the seam. Based on fifty five measurements taken from local drill holes and mine records, internal rock thickness varies from 0” to 4.8” (12.2 cm) and average 0.6” (1.5 cm). It is expected that this internal rock thickness range will be typical throughout the WEL and WM coal leases.



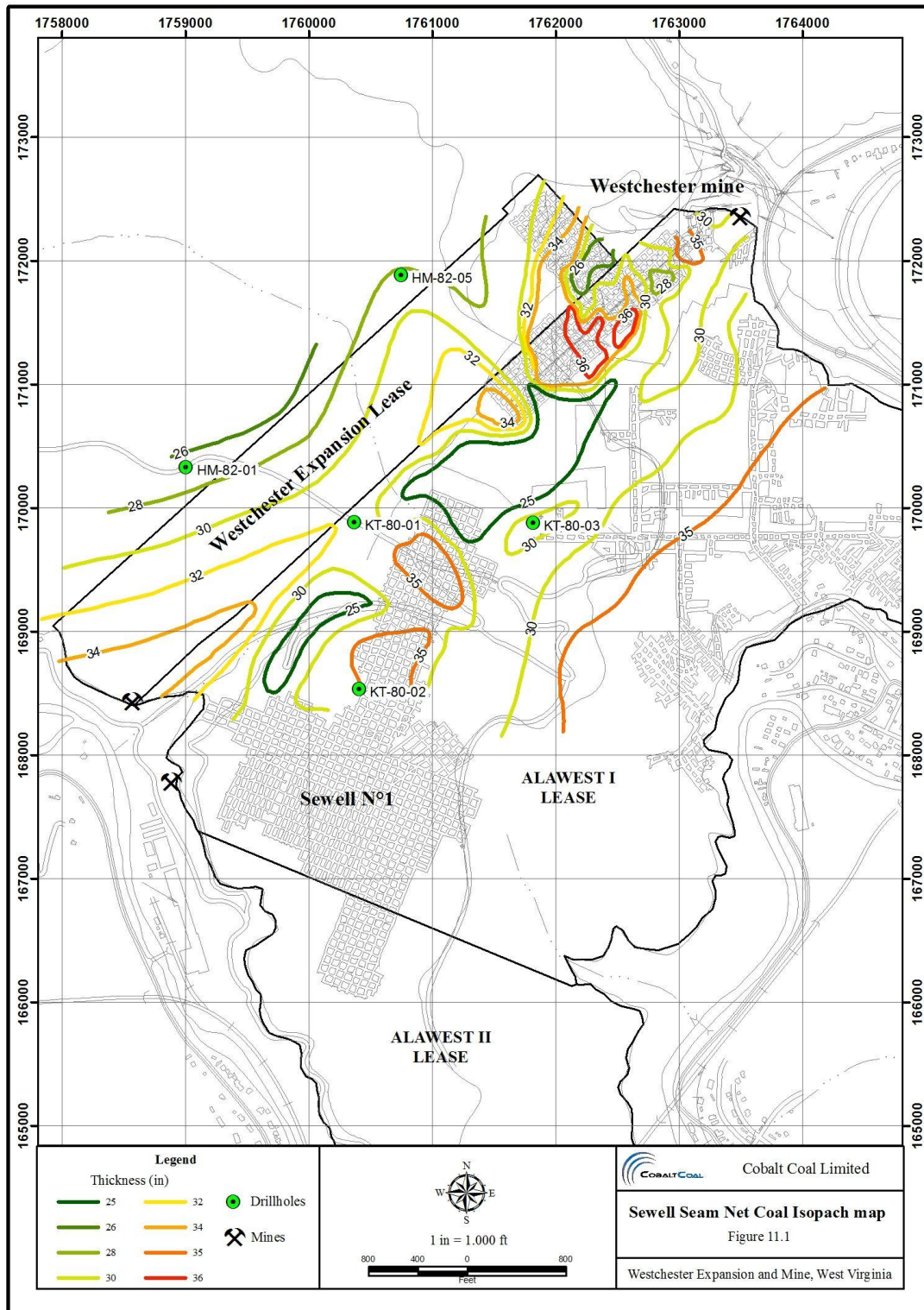


Figure 11-1 Sewell Seam Net Coal Isopach Map

The Kanawha Formation conformably overlies the New River Formation and extends from the Lower Douglas Seam at the base to the Stockton Seam near the top. This formation includes as many as eleven seams, the most important of which are the Campbell Creek Coal Zone, the Winifred Seam, the Coalberg Seam and the Stockton Seam. These seams are not resource targets on the WEL and WM coal leases however; they demonstrate the prolific development of coal in the stratigraphic sequence in this area.

## 12 EXPLORATION

Other than the five old exploration drill holes, drill during 1980 and 1982 by the Virginia Crews Coal Company i.e. KT-80-01, KT-80-02, KT-80-03, HM-82-01 and HM-82-05, most of the exploration that has been completed on or adjacent to the WEL and WM coal leases has been performed in conjunction with the 2008-2012 mining operations at Cobalt's Westchester Mine and the northwest sectors of the abandoned Sewell No.1 and Hampton Roads underground mines. The exploration data available from these sources is extensive and includes one hundred and nine structure control points and eighty six seam thickness measurements points for the Sewell Seam as is illustrated on Table 12-1.

**TABLE 12.1 EXPLORATION DATA POINTS FROM MINE RECORDS**

| <b>Mine</b>      | <b>Structure Points</b> | <b>Seam Thickness Points</b> |
|------------------|-------------------------|------------------------------|
| Westchester Mine | 75                      | 51                           |
| Sewell No.1      | 16                      | 20                           |
| Hampton Roads    | 18                      | 15                           |
| <b>Total</b>     | <b>109</b>              | <b>86</b>                    |

The Virginia Crews exploration map also shows the presence of three points on the outcrop of the seam, SC-P1 and P2, west and south of the Sewell No. 1 Mine and one on the outcrop close to the portal of the Westchester Mine, SC-P6.

In addition to drilling records and the old mining data, the presence of these mines themselves provides a good basis for the evaluations in the present study regarding coal volumes and resource quantities. The old mining maps do not directly provide data concerning coal quality. However the fact that since starting production in 2008 the adjacent Westchester Mine has produced and sold 198,314 raw tons of metallurgical coal, attests to the commercial acceptance of the coal from the Sewell Seam in this area.



## 13 DRILLING

As mentioned above there are five prior core holes, KT-80-01, KT-80-02, KT-80-03, HM-82-01 and HM-82-05, within and marginal to the WEL and WM coal leases (Figures 9.2 and 11.1) for which geological and mining data on the Sewell Seam is available from the records of previous exploration. The records for these holes were provided by the Alpha Land and Resources, LLC.

A summary of the relevant data points on the Sewell Seam contained in these drill holes and used in the present study are presented in Table 13.1.

**TABLE 13.1 EXPLORATION DRILLING DATA POINTS ON THE SEWELL SEAM**

| HOLE N°         | DEPTH in FEET |        | THICKNESS | LITHOLOGY            | TOTAL COAL | Sewell Seam Picks |            |
|-----------------|---------------|--------|-----------|----------------------|------------|-------------------|------------|
|                 | From          | To     | Feet      |                      | Feet       | Top(ft)           | Bottom(ft) |
| <b>KT-80-01</b> | 762.65        | 763.65 | 1.00      | Coal                 | 1.00       | 1222.35           |            |
|                 | 763.65        | 763.75 | 0.10      | Dark Gray Shale      | 0.00       |                   |            |
|                 | 763.75        | 764.00 | 0.25      | Coal with Shale      | 0.25       |                   |            |
|                 | 764.00        | 764.25 | 0.25      | Shale with Coal      | 0.00       |                   |            |
|                 | 764.25        | 765.65 | 1.40      | Coal                 | 1.40       |                   | 1219.35    |
| <b>KT-80-02</b> | 760.40        | 761.40 | 1.00      | Coal                 | 1.00       | 1234.60           |            |
|                 | 761.40        | 761.60 | 0.20      | Dark Gray Shale      | 0.00       |                   |            |
|                 | 761.60        | 761.70 | 0.10      | Coal                 | 0.10       |                   |            |
|                 | 761.70        | 761.80 | 0.10      | Dark Gray Shale      | 0.00       |                   |            |
|                 | 761.80        | 761.93 | 0.13      | Coal                 | 0.13       |                   |            |
|                 | 761.93        | 762.00 | 0.07      | Dark Gray Shale      | 0.00       |                   |            |
|                 | 762.00        | 762.15 | 0.15      | Coal + Shale streaks | 0.15       |                   |            |
|                 | 762.15        | 762.25 | 0.10      | Shale + Coal streaks | 0.00       |                   |            |
|                 | 762.25        | 763.60 | 1.35      | Coal                 | 1.35       |                   | 1231.40    |
| <b>KT-80-03</b> | 660.60        | 661.32 | 0.72      | Coal                 | 0.72       | 1259.6            |            |
|                 | 661.32        | 662.02 | 0.70      | Coal + Shale streaks | 0.70       |                   |            |
|                 | 662.02        | 663.20 | 1.18      | Coal                 | 1.18       |                   | 1256.8     |
| <b>HM-82-01</b> | 820.90        | 821.90 | 1.00      | Coal                 | 1.00       | 1229.1            |            |
|                 | 821.90        | 822.30 | 0.40      | Coal + Shale streaks | 0.40       |                   |            |
|                 | 822.30        | 822.70 | 0.40      | Shale + Coal streaks | 0.00       |                   |            |
|                 | 822.70        | 823.90 | 1.20      | Coal                 | 1.20       |                   | 1226.1     |
| <b>HM-82-05</b> | 645.40        | 646.20 | 0.80      | Coal                 | 0.80       | 1214.6            |            |
|                 | 646.20        | 646.25 | 0.05      | Dark Gray Shale      | 0.00       |                   |            |
|                 | 646.25        | 646.55 | 0.30      | Coal                 | 0.30       |                   |            |
|                 | 646.55        | 646.60 | 0.05      | Dark Gray Shale      | 0.00       |                   |            |
|                 | 646.60        | 647.90 | 1.30      | Coal                 | 1.30       |                   | 1212.1     |

## **14 SAMPLING METHOD and APPROACH**

Typical procedures for sampling of the Sewell Seam on the WEL and WM coal leases consist of the cutting of channel samples across the coal beds in the mine workings, measuring and recording separately the coal bands and partings.

Cores were cut from a total of fourteen holes in the early 1980's. Five of these are used in this study and are summarized in the previous section. Cores were examined following retrieval and all field sub-samples were then sealed before being forwarded to the laboratory for testing and analysis. Channel samples from the mine workings were similarly processed.

Coal quality testing programs were carried out on the core samples of the various holes in the years from 1980 to 1983 by various independent laboratories and the results from this testing are still available today.

The testing programs on the core samples were targeted to a specific set of parameters that demonstrate the metallurgical properties of the coal. These analysis and those from three recent bulk samples taken from underground at the Westchester Mine by Cobalt personnel are described in Section 18.

## **15 SAMPLE PREPARATION, ANALYSIS and SECURITY**

The principal analytical data used in this report is based on core samples collected from the five 1980-82 exploration holes KT-80-01, KT-80-02, KT-80-03, HM-82-01 and HM-82-05. The author has no way of verifying sampling procedure other than to re-state the observations of Jordan 2009;

“Recovered coal intervals are sampled using the following criteria: the minimum thickness for a coal sample is 10 cm, all non-carbonaceous partings >50 cm are not sampled and in-seam partings, to a maximum thickness of 5 cm, will be included in a coal sample. Collected samples are cleaned of any mud contamination and placed in individual plastic bags. The bags are labelled on the outside with both the core hole and sample number and sealed with plastic tape to prevent excessive moisture loss. The sample bags are placed together in a collection bag for the core hole before being placed in palletized containers and shipped to an independent lab for analysis. All testing is completed in an independent laboratory that uses industry standard ASTM testing methods and procedures”.

The test results used in the current report were obtained from analyses performed in recent times but also from laboratories that performed this work several decades ago. All of these laboratories

were certified according to US Government agencies or licensing groups that apply to the type of analyses performed. There are two types of analyses generally performed on coal samples: wet chemical laboratory analyses and petrographic studies.

The wet chemical analyses for coal are “Proximate Analysis” and “Ultimate Analysis”. These are standard tests for coal and are performed according to procedures specified by the American Society for Testing and Materials (ASTM).

Petrographic studies are used to identify the maceral composition of the coal and its reflectance. These factors are usually used to identify the rank of the coal and to deduce some of the coking properties of the specific samples.

William H. Noone Associates Inc. provided analytical certificates for core holes HM-82-01 and HM-82-05. Commercial Testing and Engineering Company provided wet lab analytical results for holes including KT-80-01, KT-80-02 and KT-80-03.

In coal work, additional special security methods for the shipping and storage of samples are not commonly employed, as coal is a relatively low value bulk commodity.

## **16 DATA VERIFICATION**

The original records for all five drill holes used in this study include standard drill core logs containing observations on lithology, coal content, interval widths, core recovery and the like made on site and bore holes geophysical logs. These two sources of data were reviewed and it was concluded that the seam picks are in close agreement with each other.

Cobalt’s mine sampling and surveying procedures were reviewed by the author during the visit to the property during the 22-24 August, 2012. In the author’s opinion, the field procedures used by Cobalt’s mine personnel and contract consultants and technicians generally conforms to industry best practices.

The coal quality data from the drill hole core samples was also reviewed (and discussed in Section 18). These results were considered in the light of general published data concerning the quality of the Sewell Seam. No significant inconsistencies with respect to the drilling data were detected and it is believed that the core analysis results are representative.

There is no means by which the quality of the coal extracted from the old mines can now be verified. However it should be noted that Cobalt’s Westchester Mine has successfully sold over 198,314 tons of metallurgical grade coal since start up in 2008. This suggests that the Sewell Seam coal on the WEL and WM coal leases can meet the specifications of the market place.

## **17 ADJACENT PROPERTIES**

Adjacent to the northwest of the WEL is a coal tract that is referred to as the RGGGS Lease. The company is currently conducting discussions with the current owner with a view to acquiring this lease. This area has been subject to drilling and the records for these have been made available for use in the present report.

## **18 MINERAL PROCESSING and METALLURGICAL TESTING**

The equivalent terminology, which will be used in this report with respect to the coal on the WEL and WM coal leases, is "Coal Quality and Processing".

### **18.1 Coal Quality and Processing**

Based on the analytical data available, Sewell Seam coal, such as that found on the WEL and WM coal leases has an ASTM rank of Low to Medium Volatile Bituminous and can be utilized as a metallurgical coal in the steel industry. There are no on site-coal processing facilities; run-of-mine coal would be sold as the product to a central washing plant that operates as a custom milling facility.

### **18.2 Coal Quality on the Lease Area**

Core samples from exploration drill holes KT-80-01, KT-80-02, KT-80-03, HM-82-01 and HM-82-05 in the WEL and WM coal leases area were analysed by different independent coal testing laboratories for an extensive suite of coal quality parameters. The most common analytical techniques used are Proximate and Ultimate analysis.

#### **Proximate Analysis**

In this analysis the determination of moisture, ash, volatile matter and fixed carbon in a sample is made. The fixed carbon is determined by difference and the four components total 100%. There is no moisture value for samples tested on a dry basis, as is the case here.

#### **Ultimate Analysis**

This test is used to determine the chemical components of a coal sample, the sulphur content of which is normally the most important. The Sewell Seam within the WEL and WM coal lease area has low sulphur content, usually less than 1%.

The analytical test results for the Sewell Seam coal samples taken from the five drill holes above are presented Table 18.1.

The average values and significant ranges for the more important parameters are:

- The Dry basis clean coal Ash is 4.79%;
- The average Yield is 73.8%;
- The Ash Fusion Temperature is high;
- The Free Swelling Index ranges from 8.5 to 9; and
- The volatile matter (VM cc DB) ranges from 19.78% to 20.74%.

**TABLE 18.1 EXPLORATION DRILL HOLE CLEAN COAL QUALITY RESULTS**

| ANALYTICAL TEST               |                  | DRILL HOLES |          |          |          |          |               |
|-------------------------------|------------------|-------------|----------|----------|----------|----------|---------------|
|                               |                  | KT-80-01    | KT-80-02 | KT-80-03 | HM-82-01 | HM-82-05 | Average       |
| <b>Proximate Analysis</b>     |                  |             |          |          |          |          |               |
|                               | Ash (DB wt%)     | 4.37        | 4.63     | 5.62     | 4.13     | 5.21     | <b>4.79</b>   |
|                               | Vols (DB wt%)    | 20.08       | 19.93    | 19.78    | 20.66    | 20.74    | <b>20.24</b>  |
|                               | F. C. (DB wt%)   | 75.55       | 75.44    | 74.60    | 75.21    | 74.05    | <b>74.97</b>  |
|                               | T Sul. (DB %)    | 0.72        | 0.68     | 0.70     | 0.81     | 0.64     | <b>0.71</b>   |
|                               | CV (Btu/lb DB)   | 15,012      | 15,012   | 14,781   | 15,021   | 14,826   | <b>14,930</b> |
| <b>Ultimate Analysis</b>      |                  |             |          |          |          |          |               |
|                               | Carb. (DB wt%)   | 85.66       | 85.22    | 84.05    | 85.06    | 85.37    | <b>85.07</b>  |
|                               | Hyd. (DB wt%)    | 4.7         | 4.69     | 4.68     | 4.46     | 4.5      | <b>4.61</b>   |
|                               | Nit. (DB wt%)    | 1.45        | 1.44     | 1.35     | 1.47     | 1.41     | <b>1.42</b>   |
|                               | Chl. (DB wt%)    | 0.12        | 0.13     | 0.13     | 0.12     | 0.12     | <b>0.12</b>   |
|                               | Ox. (DB wt%)     | 2.98        | 3.21     | 3.47     | 2.91     | 2.87     | <b>3.09</b>   |
| <b>Free Swelling Index</b>    |                  | 9.0         | 9.0      | 8.5      | 9.0      | 9.0      | <b>8.9</b>    |
| <b>Ash Fusion Temperature</b> |                  |             |          |          |          |          |               |
|                               | Initial (Deg. F) | +2,700      | +2,700   | +2,700   | 2,690    | +2,800   | <b>+2,700</b> |
|                               | Fluid (Deg. F)   | +2,700      | +2,700   | +2,700   | +2,800   | +2,800   | <b>+2,740</b> |
| <b>Yield Wt%</b>              |                  | 68.9        | 61.2     | 78.5     | 77.4     | 83.1     | <b>73.8</b>   |

The author is of the opinion that the spacing of the available coal quality data for the Sewell Seam in the WEL and WM coal lease area is adequate for characterization of the in-place quality parameters.

## **19 MINERAL RESOURCES and MINERAL RESERVE ESTIMATES**

The following is a discussion of the criteria and results obtained for the coal resource estimation for Cobalt's WEL and WM coal leases in West Virginia. Coal resources on the WM leases were previously the subject of a 2009 Technical Report, authored by Geoff Jordan P.Geo., which quantifies total in place 'Measured' resources of 1,228,700 tons amenable to underground mining. Different parts of that public report have been extracted or summarized as appropriate for inclusion in this technical report. In accordance with NI 43-101 and the CIM Definition Standards, the author of this report is the Qualified Person, responsible for the data validation and the resource verification work.

### **19.1 Resource Estimation Approach**

In accordance with National Instrument 43-101, the author has used the Canadian Institute of Mining, Metallurgy and Petroleum "Definition Standards on Mineral Resources and Reserves" adopted by CIM Council in 2010 and, as appropriate, the Geological Survey of Canada Paper 88-21 "A Standardized Coal Resource/Reserve Reporting System for Canada", during the classification, estimation and reporting of the coal resources for the WEL and WM coal leases.

The author's estimation approach was as follows:

1. Production of cross-sections and isopach maps of the coal seams from the drill hole and mine data points in order to develop a computer generated solids model for volume estimation.
2. Volumes were converted to tonnage by application of density values representative of the modeled seam on a net coal basis. Seam density values were obtained from coal quality data for five drill holes described in section 13 and by reference information obtained from public sources.
3. Initial geological interpretations and their relationship to the raw data were confirmed through the model building process and discussions with Cobalt personnel.
4. Coal thicknesses were confirmed for the five drill holes used. Copies of the drill logs for these holes were provided by Alpha Land and Resources, LLC. Numerous seam thickness measurements from the Westchester, Sewell No.1 and Hampton Roads Collieries Mines also showed consistency in the seam thickness between the mine data and drill logs.
5. The level of geological complexity was established through the review of the geological maps, drill hole data and the construction of cross-sections and structure contour maps.
6. Review of the drill hole spacing and data on the existing mine maps was used to classify the resources.

## **19.2 Assumptions and Criteria**

The following assumptions and criteria have been used in the resource estimate:

1. The Geological Type is classified as "Low A".
2. The minimum net coal thickness of 22" (55.9 cm) was used for potential underground mineable coal. This value is applicable to commercial underground mining operations for coal in this region of the United States. Minimum thickness criteria for underground mining as described in GSC Paper 88-21, which were originally designed for mines developed in Western Canada, do not apply in this region of the eastern United States; there are extensive commercial and economic operations in this area where the GSC criteria are normally exceeded. The criteria used in this report are those that are typically used for coal resource estimation in West Virginia.
3. All parting material of any thickness was separately addressed.
4. Maximum depth of 600m for potentially underground mineable coal was applied.
5. The data spacing is consistent with and exceeds the minimum standards of GSC Paper 88-21 requirements.
6. A value of 1.28 g/cc was used for the conversion of volumes of clean coal to tons. This is the minimum bulk density value that should be expected for Low-Medium volatile bituminous coal with an ash content as low as 4.79 wt% based on Table 1 in GSC Paper 88-21.

## **19.3 Areas Addressed**

This report only addresses resources within the Westchester Expansion Lease and the North Resource Block of the 2009 Norwest Technical Report. The author has reviewed the resource estimations contained within this later report and concludes that there have been no exploration or mining activities in the South Resource Block area subsequent to the date of the Norwest report that would necessitate a revision of the Norwest coal resource estimate for this block. All of the area of the WEL and WM coal leases where the Sewell Seam is in-place constitutes the resource area addressed by this report.

## **19.4 Resource Classification**

Resources are classified according to the confidence level that can be placed in each estimate. In accordance with the criteria of the CIM Guidelines, which apply to coal deposits, resources are classified as Measured, Indicated and Inferred proceeding from that with the highest confidence level to the lowest. Besides the resource classification scheme of the CIM Guidelines, National Instrument 43-101 suggests that the criteria of Geological Survey Paper 88-21 be referred to if

necessary. The distinction between different classes of resources in that paper are based on the spacing of valid data points which, in this case, are coal drill hole intersections and underground mine data. The concept is that the closer the data points are spaced the higher the confidence that can be placed in the resource estimate.

The maximum spacing of the data points used in the WEL and WM coal leases resource estimation was 610 metres between drill hole HM-82-01 and the Sewell Coal outcrop data point SC-P1 in the southwest corner of the WEL. Generally however the data point spacing is less than 485 metres and as low as 6.5metres in the mines. All are well within the “maximum distance from nearest data point criteria” of 800 metres recommended in GSC Paper 88-21, Table 5, for the measured resources category in Geology Type Low - A coal deposits. In addition recent mining by Cobalt in the resource area demonstrates excellent continuity of the Sewell Seam along strike and down dip of 550m and 460m respectively.

In the present report the criteria of GSC Paper 88-21 were generally referred to but the author ultimately judged the classification categories based on his industrial experience and the fact that there are also closely adjacent and extensive past and current mining operations in this area. Based on the general criteria of GSC Paper 88-21 resources classed as Measured are present.

## **19.5 Coal Resource Estimate**

The term “resource” is utilized to quantify coal contained in seams occurring within specified limits of thickness and depth from surface. The term “resource” refers to the in-place inventory of coal that has ‘reasonable prospects for economic extraction’. Coal resources are always reported as in-place tonnage and not adjusted for mining losses or recovery. However coal thickness and removable parting thickness are considered.

The new seam thickness and structure data points generated by Cobalt’s mining activities post the 2009 Norwest Technical Report result in changes to the geological model for WM North Block resource area. The net result of these changes was a modest increase of Norwest’s 2009 resources for this block from 304,800 tons to 336,800 tons. Norwest’s South Block resources are unaffected by the new geological model and remain at 923,900 tons.

In-place coal resources on the WEL and WM coal leases, after adjustment for the tons mined as of September 15, 2012 by Cobalt from both the WEL and WM North Block, are summarized in Table 19.1. They cover the area of the WEL and WM coal leases shown on Figure 19-1. These resources address only the Sewell Seam which is the resource target on the WEL and WM coal leases.

There may be other coal resource tonnages in several other seams but these are not addressed in this report. The practices of GSC 88-21 specify that resources be reported inclusive of the coal reserves based on the idea that reserves are simply a special class of resources.



**TABLE 19.1 WESTCHESTER EXPANSION and MINE NET COAL RESOURCE SUMMARY**

| RESOURCE AREA            | DEPOSIT TYPE | ASTM GROUP                         | IN-PLACE COAL RESOURCES<br>(KTONS) |           |          |
|--------------------------|--------------|------------------------------------|------------------------------------|-----------|----------|
|                          |              |                                    | MEASURED                           | INDICATED | INFERRED |
| WESTCHESTER<br>EXPANSION | UNDERGROUND  | LOW-MED,<br>VOLATILE<br>BITUMINOUS | 625.2                              | 0         | 0        |
| NORTH BLOCK              | UNDERGROUND  | LOW-MED,<br>VOLATILE<br>BITUMINOUS | 208.2                              | 0         | 0        |
| SOUTH BLOCK              | UNDERGROUND  | LOW-MED,<br>VOLATILE<br>BITUMINOUS | 923.9                              | 0         | 0        |
| <b>TOTAL</b>             |              |                                    | <b>1,757.3</b>                     |           |          |

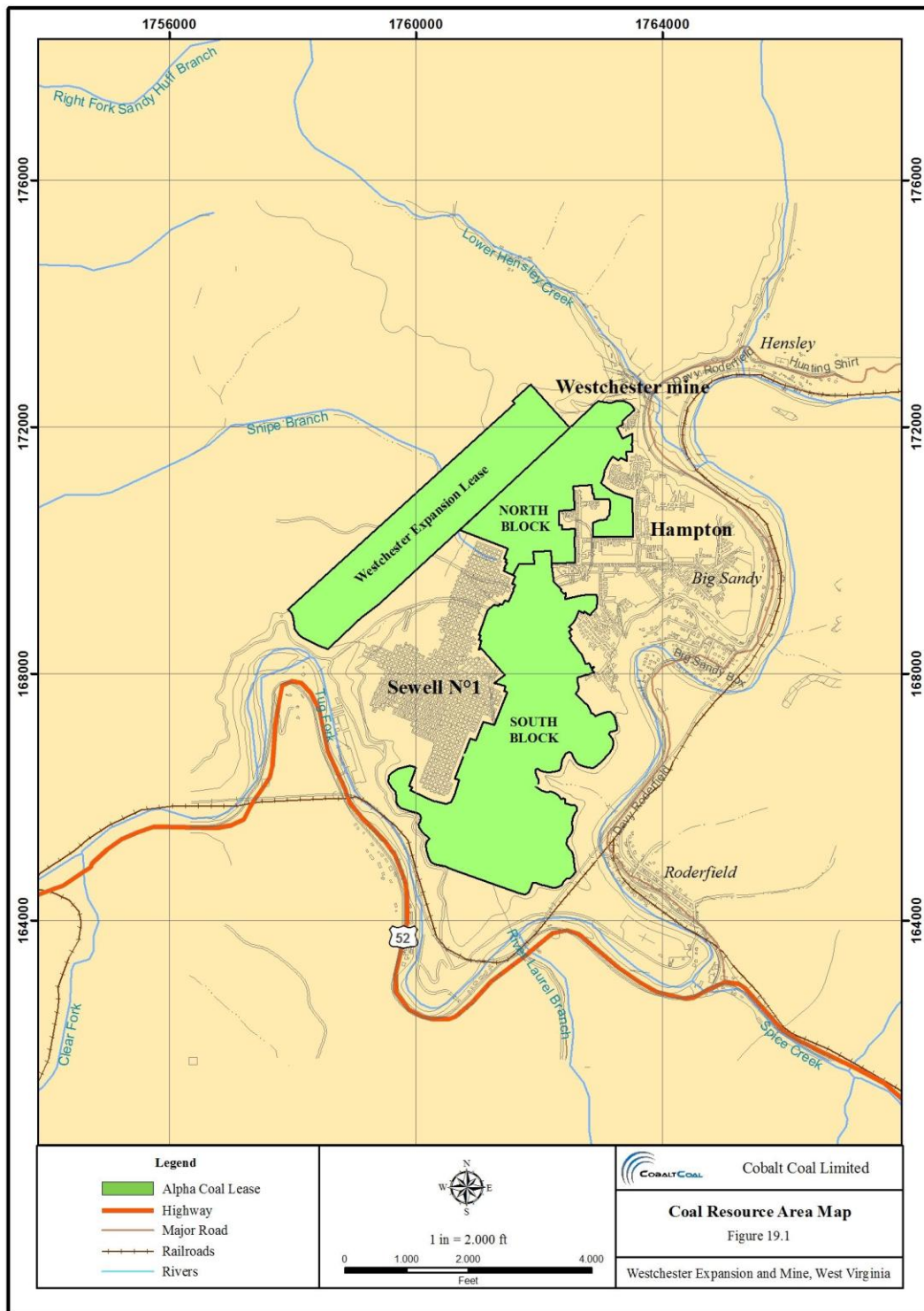


Figure 19-1 Westchester Expansion and Mine Coal Resource Areas

## 19.6 Coal Reserve Estimate

A coal reserve is the economically mineable part of a 'Measured' and 'Indicated' coal resource demonstrated by at least an economic analysis, which includes information on mining, processing, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction is feasible.

Coal reserves are sub-divided in order of increasing confidence into 'Probable' and 'Proven' reserves, respectively. A 'Probable' coal reserve is the economically mineable part of an 'Indicated' resource, and in some cases of a 'Measured' resource. A 'Proven' coal reserve is the economically mineable part of a 'Measured' resource.

The 2009 Norwest Technical Report quantifies 'clean coal reserves' for the WM leases, North and South Blocks. As stated in section 19.5 of that report these 'reserves' are based on a mine design and financial analysis completed by Norwest as part of a pre-feasibility study prior to the Westchester Mine being put into production.

The criteria used for mine design and reserve estimation are stated by Norwest to be: Recovery dilution (in and out of seam) of 37%, a 50' lateral barrier against old workings, a 50' cover height at outcrop, minimum cutting height of 39", minimum net coal thickness of 20" and unspecified "coal seam recovery factors".

Norwest's Figure 19-2 is presented as indicating the location of the 'coal reserve areas'. This map is identical to Figure 19-1 which is presented as indicating the 'coal resource areas'. In fact it would appear that the only areas of the North and South Blocks addressed by Norwest with respect to reserves are those included within Norwest's proposed mine plan and shown in their Figure 25-1. Norwest's mine plan uses a minimum 200' lateral barrier against old workings, contrary to the 50' limit quoted throughout the report.

Inconsistencies, as previously mentioned, economic changes since the study was done in 2009, Cobalt's current mining costs and lack of profitability to date, permits which allow Cobalt to mine within 50' of old workings and the new geological model for the North Block resource derived from Cobalt's recent mining in this area, lead the author to conclude that no coal reserves can confidently be stated for any of the WEL or WM resource areas at this time.

Considering the increased risk of mining without a valid, current economic analysis and coal reserve estimate the author strongly recommends that Cobalt commission a new economic and mining study of both the WEL and WM leases to allow quantification of a 'coal reserve'.

## **20 OTHER RELEVANT DATA and INFORMATION**

### **20.1 Mining Operations**

During the authors visit to the property during August 22-24, 2012 the Westchester Mine was actively mining coal underground from the Sewell Seam on the WM Alawest I lease at an average rate of about 3,200 tons per month.

#### **20.1.1 Mining Method**

The mining method being used at the time of the authors visit was room-and-pillar. In this underground mining method, tunnels (“entries”) are dug into the seam by machine. The main entries extend from the portals at surface to the furthest extent of the resource area and are connected by “cross-cuts”, a second set of tunnels dug orthogonal to the entries to form a network. The primary phase of mining, then in progress, consists of 20’ wide entries and 20’ wide crosscuts on 60’ centers, which produces a regularly spaced grid of 20’ wide “rooms” and 40’ wide “pillars”. The minimum height of entries and crosscuts is 43” to accommodate the “continuous miner”, a remotely operated, electric powered, low-height, cutting machine used to harvest the coal. The cut coal is transported by a conveyor belt system from the working face to a stockpile at surface.

At the time of the author’s visit Cobalt had completed their planned primary phase mining in two panels; a) 2000’ x 440’ panel in the Alawest I lease adjoining and parallel to the SE boundary of the WEL and b) 840’ x 240’ panel across the NE end of the WEL (Figure 20-1). Observations made by the author during an examination of these workings and discussions with Cobalt’s mine staff confirm that the Sewell Seam is continuous and predictable throughout the mined area with only minor local variations due to “swells” in the floor of the seam as discussed in section 9.2.

#### **20.1.2 Coal Processing**

There is no on site processing plant; stockpiled coal extracted from the mine is being trucked to the Alpha Natural Resources (“ANR”) custom washing plant where it is ‘cleaned’. ANR is also Cobalt’s main purchaser of ‘clean coal’.

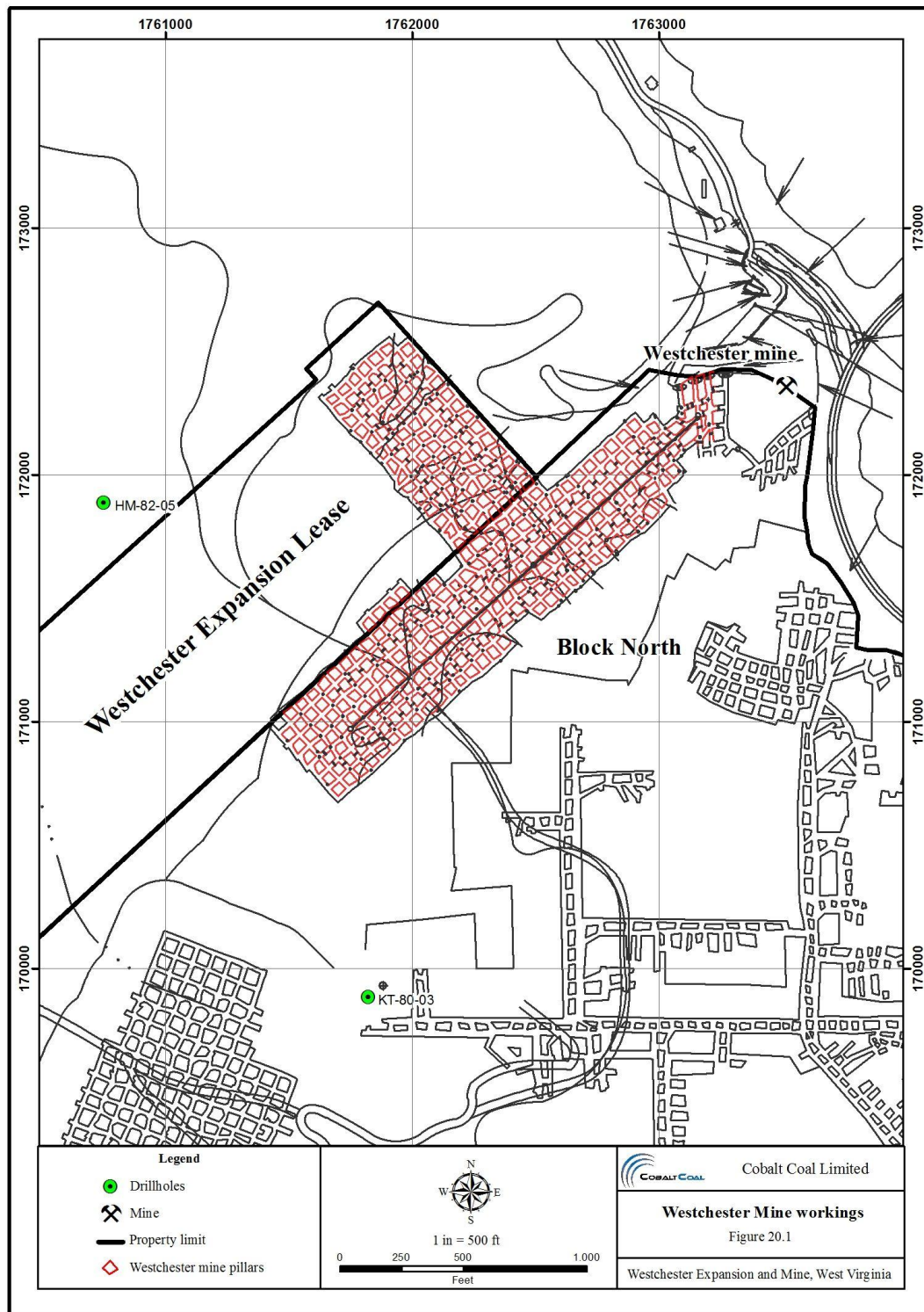


Figure 20-1 Westchester Mine Workings

## **20.2 Environmental Considerations**

The Westchester Mine is subject to environmental monitoring and permitting by both US state and federal agencies. Cobalt holds current mine permits issued by the state of West Virginia mining authorities including one from the West Virginia Department of Environmental Protection, DEP permit, and one from the US EPA which is a National Pollutant Discharge Elimination System (NPDES) permit. As requirements to maintain these permits current; water leaving the permit area must first be passed through a settling pond and the water subsequently released must satisfy the limits set in the NPDES permit, roads and stockpiles must be watered when necessary to control dust and a reclamation bond must be lodged with the state authority.

The reclamation bond has been lodged with the state authority and Cobalt maintains a program of water quality testing as part of its compliance with these permits. Five sampling sites have been established; four of these are tested bi-monthly, the fifth, a local drinking water supply, is used as a baseline and tested quarterly. The water samples are analysed at an independent laboratory principally for pH, Total Dissolved Solids, Total Suspended Solids, iron, manganese and aluminum. The results are filed with the appropriate authority on a monthly basis.

## **21 INTERPRETATION AND CONCLUSIONS**

Cobalt Coal Ltd.'s WEL and WM coal leases cover 898.6 acres of the Sewell Coal Seam, which throughout the leases, demonstrates lateral stratigraphic continuity with thickness variations that are caused only by local stratigraphic changes and associated differential compaction. Tectonic deformation in this area is slight and thus the structural geology of the lease area is very simple consisting of flat-lying unfaulted beds. As a result, the geology type can be classified as Low Type A according to the guidelines set forth in Geological Survey of Canada Paper 88-21.

The verification of the local geology and the estimation of coal resources were accomplished through review of current practices and procedures, inspection of a sampling of raw data, drilling data and mine records and a site visit. Estimates of volumes and tonnages were achieved through the production of a geological model.

The density of drilling, current and past mining activity in and adjacent to these leases is considered by the author to be adequate for the delineation of measured resources amenable to underground mining. There are three contiguous areas of coal resources underlying the whole of the WEL and WM coal leases which as of September 27, 2012 are estimated to total 1,757,300 tons.

Inconsistencies, as previously mentioned in the Norwest study, economic changes since the study was done in 2009, Cobalt's current mining costs and lack of profitability to date, permits which allow Cobalt to mine within 50' of old workings and the new geological model for the North Block resource derived from Cobalt's recent mining in this area, lead the author to conclude that no coal reserves can confidently be stated for any of the WEL or WM resource areas at this time.

## **22 RECOMMENDATIONS**

The WEL and WM coal lease area is well tested with respect to the coal resources of the Sewell Seam. These estimates are based on the results of exploration drilling and extensive previous mining. However, the author believes that no coal reserves can be stated of any of the resource area at this time.

Considering the increased risk of mining without a valid, current economic analysis and coal reserve estimate, the author strongly recommends that as the next phase of work Cobalt commission a new economic and mining study of both the WEL and WM leases to allow quantification of coal reserves. The author also recommends that Cobalt during any future mining operations regularly reviews coal seam data, performs geotechnical testing and updates the geological database and model as required.

### **22.1 Estimated Budgets**

The estimated total cost of the recommended programs is US\$ 70,400 as detailed in Table 22.1 below:

**TABLE 22.1 BUDGETS for RECOMMENDED PROGRAMS**

| <b>BUDGET ITEM</b>                                              | <b>US\$ COST</b>     |
|-----------------------------------------------------------------|----------------------|
| <b>A - Mining, Economic and Coal Reserve Study</b>              |                      |
| Professional Fees; Geological and Engineering                   | 23,600               |
| Site Visit; Professional Fees and Expenses                      | 7,800                |
| Support Services; Computer Tech. Drafting Fees and Expenses     | 6,200                |
| <b>Program Costs</b>                                            | <b>37,600</b>        |
| Contingencies @ 10%                                             | 3,800                |
| <b>Total Cost Estimate - Mining, Economic and Reserve Study</b> | <b><u>41,400</u></b> |

**B – Annual Geological and Geotechnical Data Base Updates**

|                                                                        |                      |
|------------------------------------------------------------------------|----------------------|
| Topographical Surveys                                                  | 10,500               |
| Geological Mapping, Data Collection and Interpretation                 | 13,700               |
| Support Services; Travel, R&B, Computer and Drafting                   | 2,200                |
| <b>Program Costs</b>                                                   | <b>26,400</b>        |
| Contingencies @ 10%                                                    | 2,600                |
| <b>Total Cost Estimate - Geological and Geotech. Data Base Updates</b> | <b><u>29,000</u></b> |



## 23 REFERENCES

- Banks, P., et al., 2003. Estimation of Mineral Resources and Mineral Reserves, Best Practices Guidelines, CIM Standing Committee.
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- Jordon, G., 2009. Technical Report, Westchester Mine, West Virginia, USA, NI 43-101 compliant Technical Report for Cobalt Blue Resources Inc.
- Hughes, J.D., et. al., 1989. A Standardized Coal Resource/Reserve Reporting System for Canada, Geological Survey of Canada Paper 88-21.
- Repine Jr., T.E., et. al., 1993. Regional and Economic Geology of Pennsylvanian Age Coal Beds of West Virginia, International Journal of Coal Geology, Volume 23, Issues 1-4, September 1993, Pages 75-101.
- West Virginia Geological and Economic Survey, MAP-WV2, Generalized Geologic Map of the Coal Fields of West Virginia, USA, on-line publication.

## 24 DATE AND SIGNATURE PAGE

This report title "Technical Report on the Westchester Expansion and Westchester Mine, Davy Quadrangle, Browns Creek District, McDowell County, West Virginia, USA prepared for Cobalt Coal Ltd. and effective September 27, 2012 was prepared by the author:



A handwritten signature in blue ink, appearing to be "T. Walker", written over a faint, larger outline of the same signature.

Dated at Langley, BC, Canada  
November 08, 2012

*"Terence Walker"*  
Terence Walker, M.Sc., P.Geo.  
Consulting Geologist.

## 25 CERTIFICATION OF QUALIFIED PERSON

I, Terence Walker: M.Sc. P.Geo. do hereby certify that:

I am a consulting geologist residing at 8760, 206 Street, Langley BC, Canada.

1. I graduated with an Honors degree in Geology from University College London, England in 1968 and I obtained a M.Sc. (Applied) degree from McGill University, Montreal, Canada in 1978.
2. I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia, professional registration number; 20116
3. I have practised my profession continuously for a total of 44 years in the mineral industry since graduation from university. My professional career covers all aspects mineral exploration from project generation through deposit development, mine geology, economic evaluation and acquisitions due-diligence in Europe, Canada, USA, Mexico and South America. My experience includes over 16 years exploring for and evaluating sedimentary deposits including coal in Canada and the United Kingdom.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association and past work experience, I fulfill the requirements to be a "qualified person" for purposes of NI 43-101.
5. I am responsible for preparation of all sections of the report titled: Technical Report on the Westchester Expansion and Westchester Mine and dated September 27, 2012 (the "Technical Report") which is based on data contained in private and public documents and a property visit conducted August 22-24, 2012.
6. I have had no prior involvement with the property that is the subject of the Technical Report.
7. I am independent of Cobalt Coal Ltd, applying all of the tests in section 1.4 of National Instrument 43-101.
8. I have read National Instrument 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with both.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.



*"Terence Walker"*

Terence Walker, M.Sc., P.Geo.  
Consulting Geologist.

Dated at Langley, BC, Canada  
November 08, 2012