Atrum Coal
COAL FOR STEEL

ASX Release

02 November 2017

KURO COAL ANNOUNCES ELAN SOUTH RESOURCE ESTIMATE

HIGHLIGHTS

- **Atrum's wholly-owned subsidiary Kuro Coal Limited has completed a JORC Resource Estimate at the Elan South area within the Elan hard coking coal project**
- **JORC open cut Resource Estimates at Elan South; Indicated (7Mt) and Inferred (29Mt)**
- **An additional Exploration Target of 200Mt**
- **Resource Estimates confirms Elan South hosts substantial emplacements of shallow hard coking coal**
- **Preliminary coal quality data indicates a hard coking coal resource**
- **Project occurs in well-established hard coking coal mining region**
- **2018 to focus on extensive definition drilling, large diameter core sampling, confirmatory quality analysis, engineering design, and baseline environmental studies to proactively accommodate future mining permits**

Atrum Coal Ltd ("**Atrum**" or the "**Company**") (**ASX: ATU**) is pleased to announce a JORC resource for the Elan South Coking Coal Project in Alberta, Canada. Managing Director, Max Wang commented: *"Elan South is progressing on schedule and we are expecting that the exploration planned in 2018 will establish Elan South as a substantial hard coking coal project.*

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As part of the due diligence for the Elan Coal Ltd ("Elan") acquisition, Atrum retained resource consultants Tamplin Resources Pty Ltd to conduct a JORC resource estimate for the Elan South project area and Bob Leach Pty Ltd to conduct a coal quality review on data obtained from previous exploration programs. Both found that Elan South project area holds substantial shallow coal resources suitable as hard coking coal. Refer to 23 August 2017 announcement, "*Kuro Coal to Acquire Elan Coal's hard coking coal properties*" for further information regarding the acquisition of Elan.

Elan South Project Summary

The Elan South (formerly called Grassy North) hard coking coal project is located in the foothills and front ranges of the Rocky Mountains of Alberta, approximately 13 km north of Coleman, Alberta. The project is 13km north from a main rail line providing access to port terminals in Vancouver and Prince Rupert (Figure 1). Elan South is the southernmost project within the Elan hard coking coal project and is made up of 4 contigous Coal Lease Applications that cover approximately 6,140 ha (Figure 2) of Elan Coal's total 22,951 ha area. In Alberta, Coal Lease Applications are granted for a term of 15 years (with the option to extend at expiry).

Figure 1: Elan Coal Project Location with rail access to 3 deep sea ports.

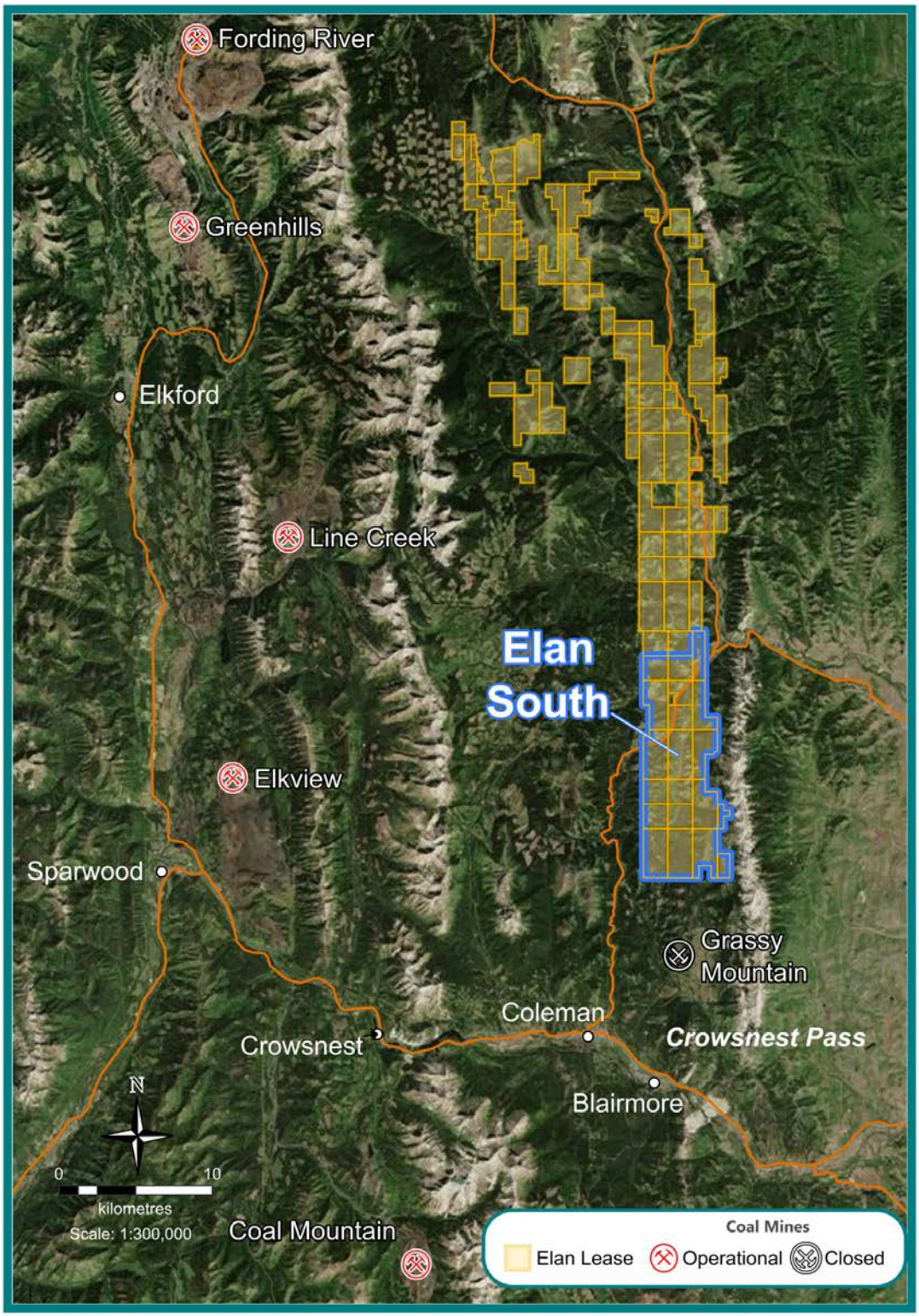

Figure 2: Location of Elan South hard coking coal project in an established mining region.

The Mist Mountain Formation at Elan South contains the economic coal seams and is capped by the recognizable Cadomin Conglomerate. There are at least three major coal seams at Elan South; from top to bottom they are the No. 1 seam, No. 2 seam, and No. 4 seam. A stratigraphic sequence can be seen in Figure 3 showing coal seam thickness with the No. 2 seam being the thickest. The No. 2 seam is known to range in thickness typically from 5 m to 15 m. These seams were mined on the Grassy Mountain open pit mine which is located 5km to the south of the Elan South property.

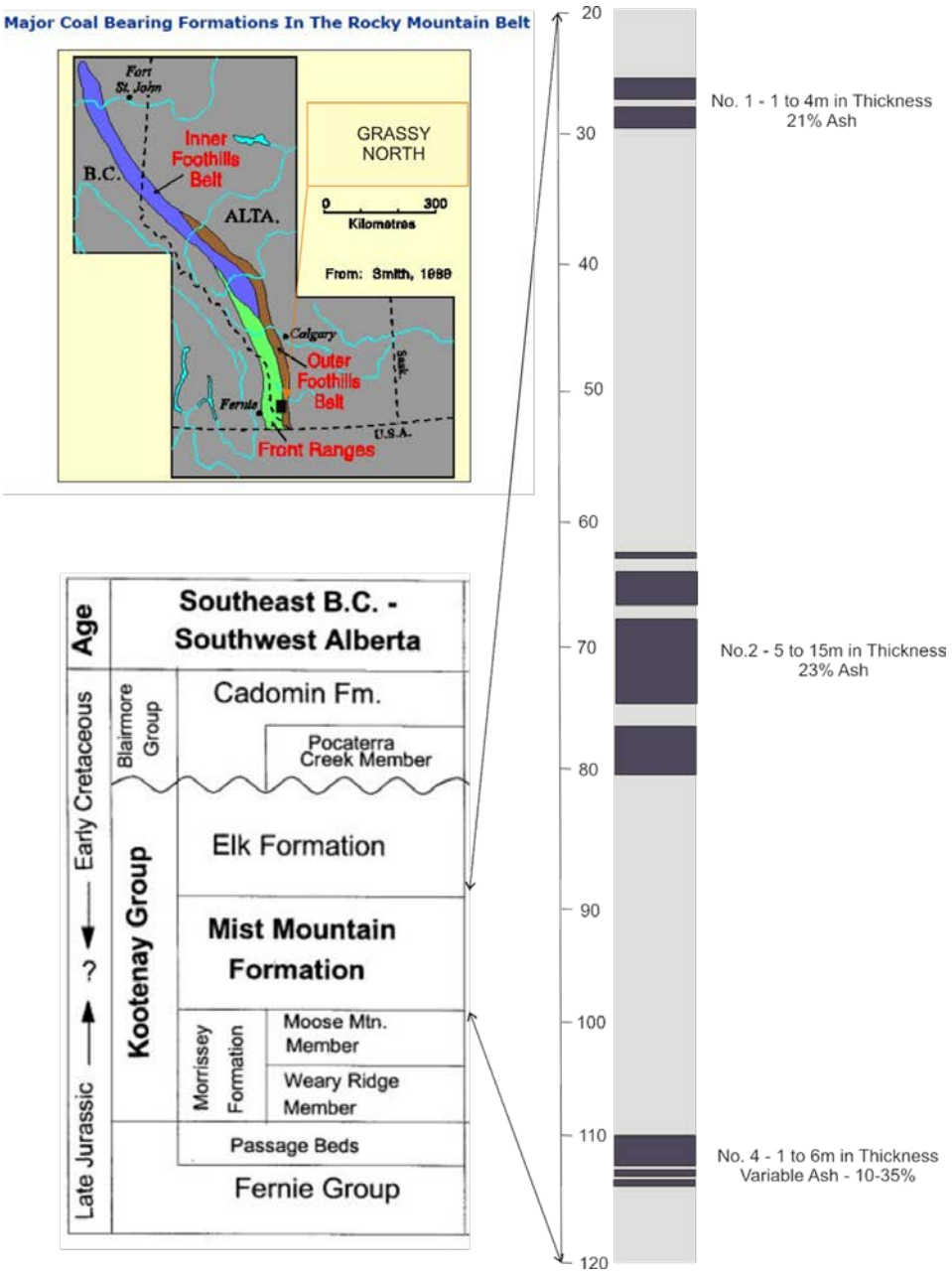

Figure 3: Stratigraphic sequence showing the Elan South coal seams.

Elan South is located within the Rocky Mountain Foreland Thrust and Fold belt within a succession of generally west-dipping thrust faults and associated folds. Like other coal fields in this region, Elan South has complex geology, with multiple stacking thrust faults (Figure 4) which, as a result have stacked coal-bearing packages on top of one another as seen in a cross section (Figure 5) of the southern poriton of Elan South. An extensive road-based drilliing program is planned in 2018 to further define the resource and structure of Elan South.

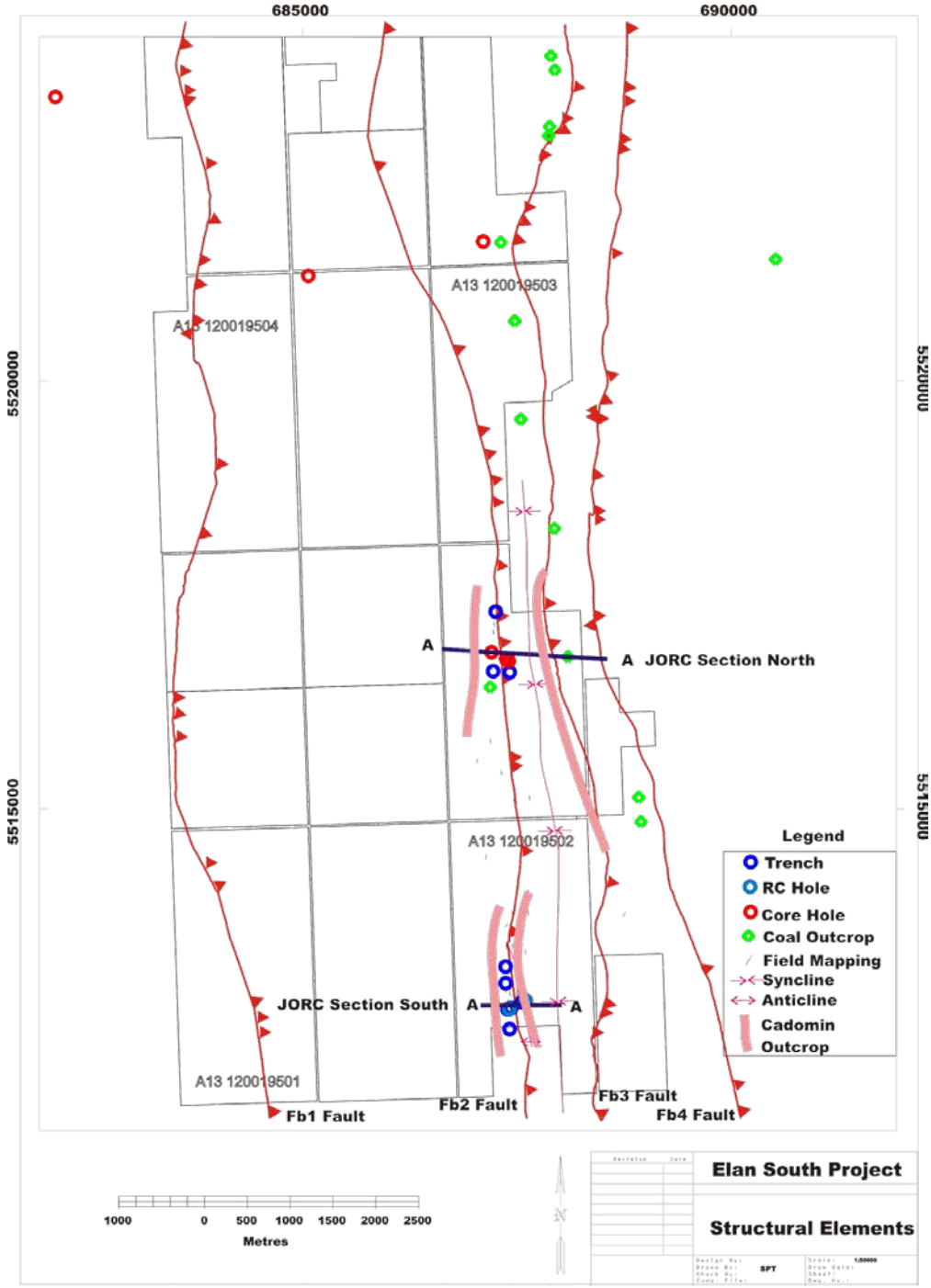

Figure 4: Simplified structural map of Elan South; note southern cross section location for Figure5.

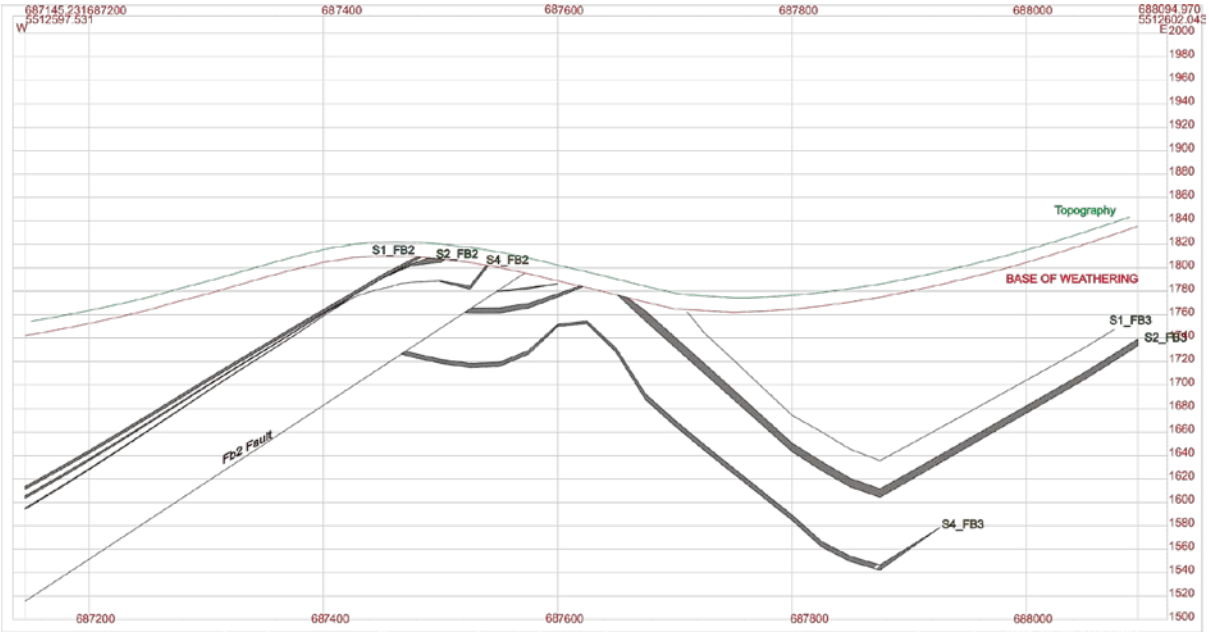

Figure 5: Cross section of Elan South located in the southern portion of the property.

Elan South Reosurce Estimate Summary

All open cut reources at Elan South are less than 300 m from surface with cumulative strip ratios limited to 20:1 bcm/t. A minimum thickness of 0.30 m was applied to all seams. Table 1 summarizes the 7 Mt indicated and 29 Mt inferred JORC resource for Elan South. Figure 6 shows the area the Resource Estimates were calculated from.

Table 1: Elan South Indicated and Inferred Resource Estimate Summary.

Total Resources - Elan South - As of the 30th September 2017								
Domain	**Seam**	**Thickness (m)**	**True Thickness (m)**	**Ash %**	**Volume (Mbcm)**	**Indicated (Mt)**	**Inferred (Mt)**	**Total Tonnage (Mt)**
North	No. 4	2.1	1.1	10.0	1.7	-	2.5	2.5
	No. 2	19.1	14.7	22.0	16.7	6.8	17.4	24.2
South	No. 4	13.1	2.5	35.0	2.8	-	4.0	4.0
	No. 2	21.2	3.7	28.0	2.8	-	4.0	4.0
	No. 1	1.5	0.8	21.0	0.4	-	0.6	0.6
All	No. 4	8.9	2.0	25.5	4.5	-	6.5	6.5
	No. 2	19.4	13.1	22.9	19.5	6.8	21.4	28.2
	No. 1	1.5	0.8	21.0	0.4	-	0.6	0.6
	Total	17.2	10.9	23.3	24.4	6.8	28.5	35.3
	Total (Rounded)					7	29	36

Insitu Moisture basis is assumed to be 5%

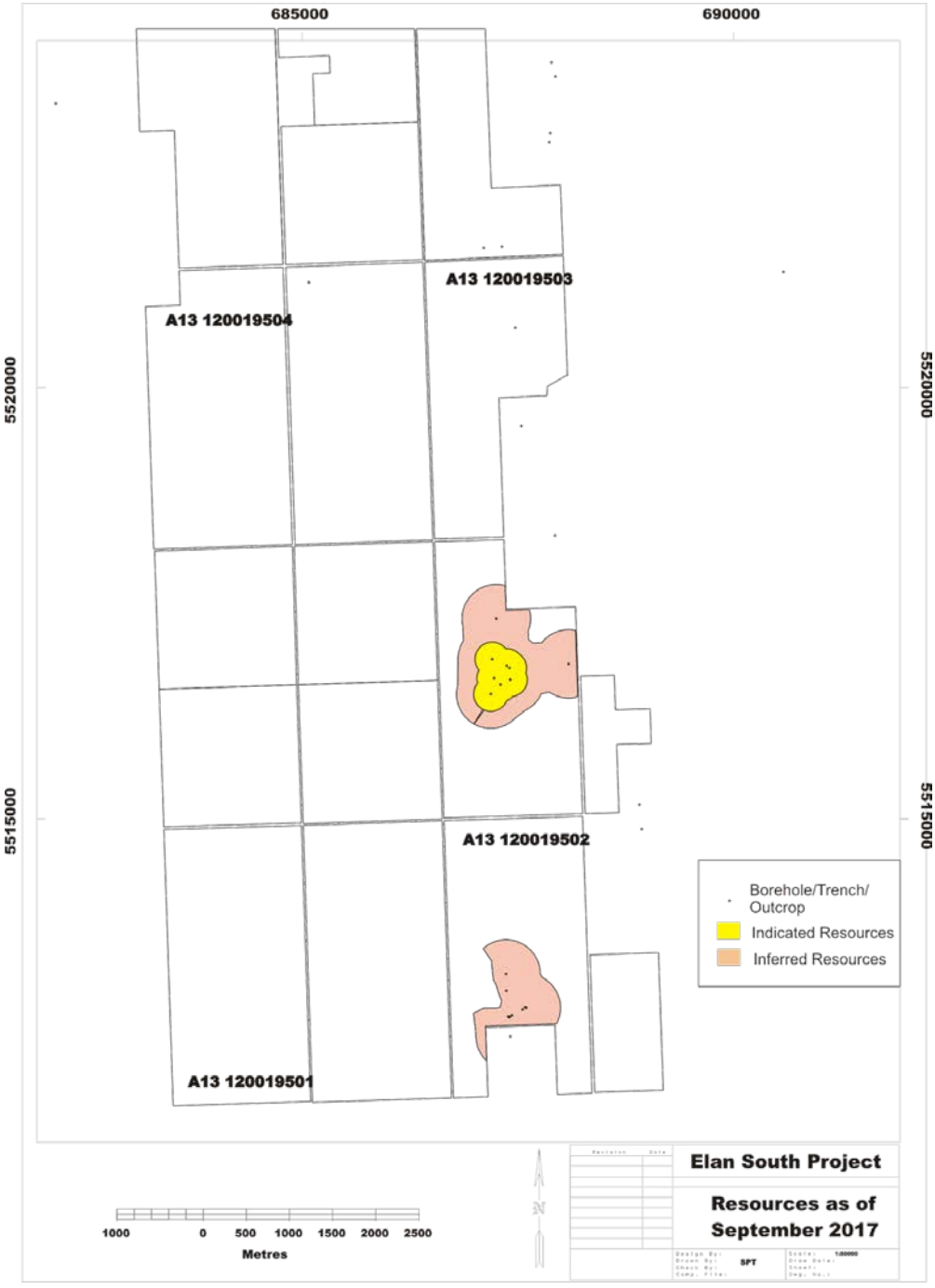

Figure 6: Two highlighted areas showing where the Elan South Resource Estimates are calculated from.

Elan South Exploration Target Summary

All Exploration Targets at Elan South are less than 300 m from surface with cumulative strip ratios limited to 20:1 bcm/t. A minimum thickness of 0.30 m was applied to all seams. Table 2 summarizes the 200 Mt Exploration Target for Elan South. Figure 7 shows the area the Resource Estimates were calculated from.

Table 2: Summary of Elan South Exploration target tonnages.

Seam	Thickness (m)	True Thickness (m)	Tonnage Mt
No. 4	4.1	2.1	37
No. 2	20.8	11.5	151
No. 1	1.3	0.6	3
Total			190
Total (Rounded)			**200**

Exploration Targets are conceptual and there has been insufficient exploration to date to estimate a Mineral Resource. There is uncertainty whether further exploration will yield a Mineral Resource.

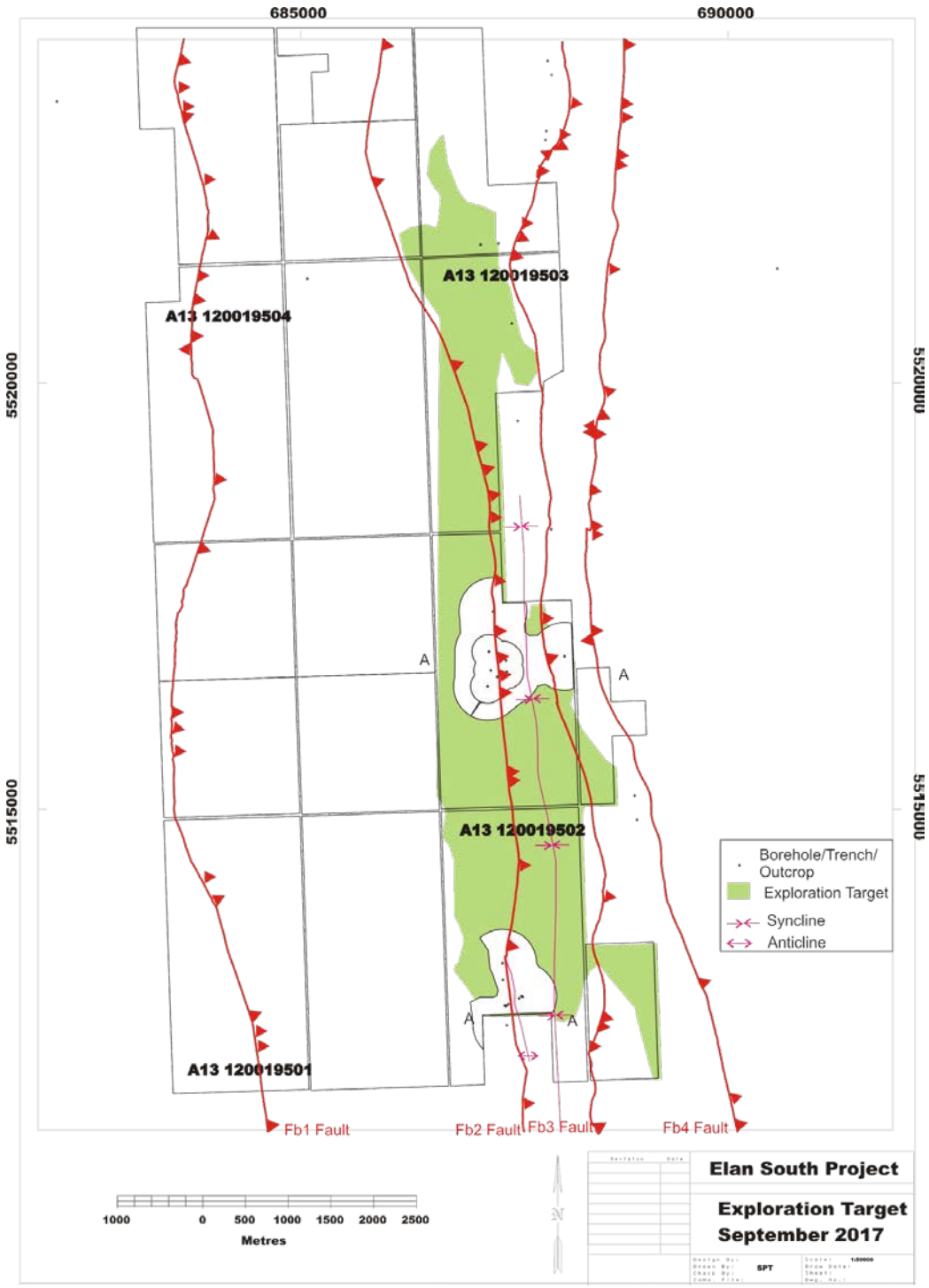

Figure 7: Highlighted area showing where the Elan South Exploration Target tonnages are calculated from.

Coal Quality

Elan previously carried out coal quality tests and published typical results as below. A review by Bob Leach Pty Ltd on previous coal quality work on 2014 exploration samples indicates that Elan South holds hard coking coal.

> Mr Leach commented: "*The results obtained from coal quality analysis indicate the resource is potentially capable of realising a mid-volatile hard coking coal (MVHCC) product. Particularly, the rank indicator RoMax which is less prone to inaccuracy due to core loss (than all other coal quality parameters), pinpoints the resource as potentially suited to producing MVHCC. A detailed exploration program is recommended to prove up the resource.*"

About Kuro Coal

Kuro Coal Ltd is a subsidiary of Atrum Coal, which holds the rights to the Elan Coking Coal Project in Alberta, Canada. Elan Coal Ltd's ("Elan") tenements are highly prospective for hard coking coal. Kuro acquired an interest in the Elan Coking Coal properties located in Alberta, Canada ("Elan properties") in 2014 (Figure 8). Refer to 23 August 2017 announcement, "*Kuro Coal to Acquire Elan Coal's hard coking coal properties*" for further information about previous Elan Coal Resource Estimates and information regarding the acquisition of Elan.

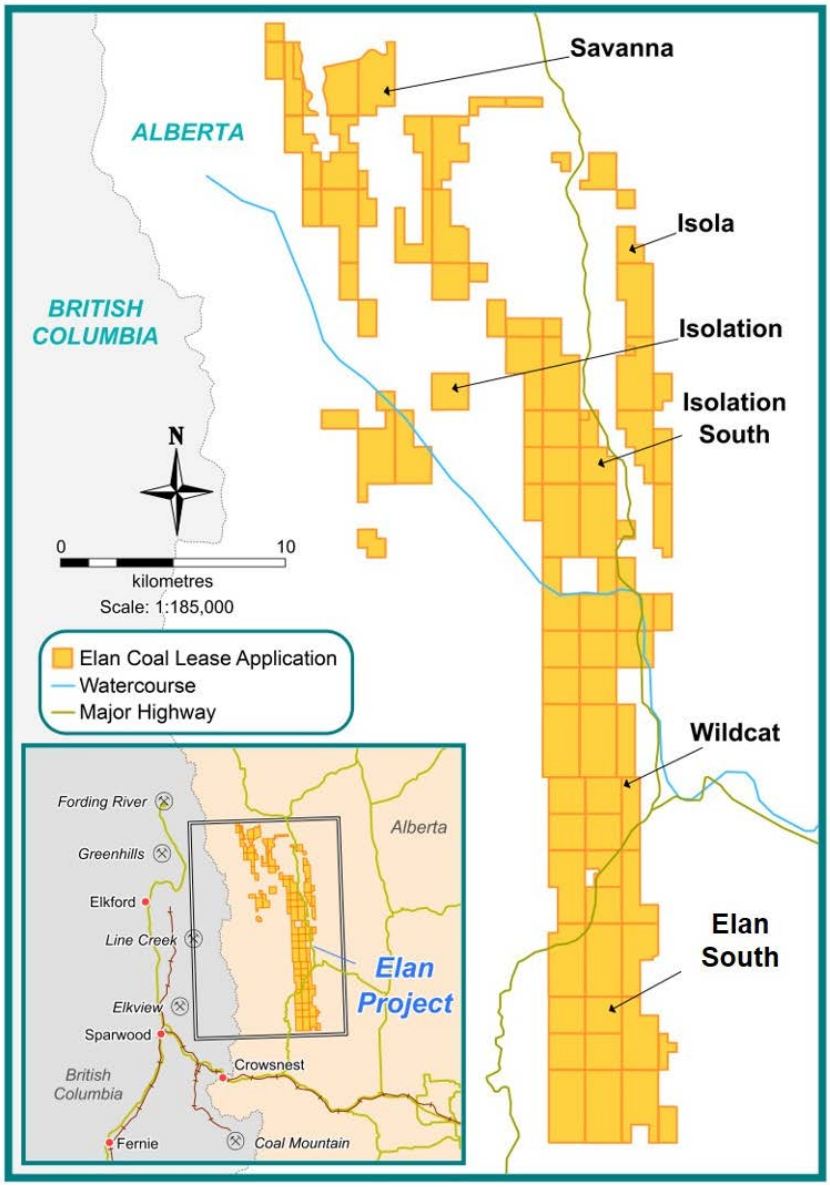

Figure 8. Elan Project target areas

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Forward Looking Statements

This presentation includes various forward looking statements which are identified by the use of forward looking words such as “may”, “could”, “will”, “expect”, “believes”, “intend”, “plan”, “estimate”, “anticipate”, “continue”, and “guidance”, or other similar words and may include, without limitation statements regarding plans, strategies and objectives of management, anticipated production or construction commencement dates and expected costs or production outputs. Statements other than statements of historical fact may be forward looking statements. Atrum believe that it has reasonable grounds for making all statements relating to future matters attributed to it in this presentation.

Forward looking statements inherently involve known and unknown risks, uncertainties and other factors that may cause the Company’s actual results, performance and achievements to differ materially from any future results, performance or achievements. Relevant factors may include, but are not limited to, changes in commodity prices, foreign exchange fluctuations and general economic conditions, increased costs and demand for production inputs, the speculative nature of exploration and project development, including the risks of obtaining necessary licences and permits and diminishing quantities or grades of resources or reserves, political and social risks, changes to the regulatory framework within which the Company operates or may in the future operate, environmental conditions including extreme weather conditions, recruitment and retention of personnel, industrial relations issues and litigation. Investors should note that any reference to past performance is not intended to be, nor should it be, relied upon as a guide to any future performance.

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Competent Person Statement

Exploration Results

The information in this document that relates to Exploration Results of Elan South project area is based on, and fairly represents, information and supporting documentation prepared by Mr Shaun Tamplin, who is a Member of the Australasian Institute of Mining and Metallurgy and is a full-time employee of Tamplin Resources Pty Ltd. Mr Tamplin has read and understands the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition). Mr. Tamplin is a Competent Person as defined by the JORC Code, 2012 Edition, having twenty years' experience that is relevant to the style of mineralisation and type of deposit described in this document.

Neither Mr. Tamplin nor Tamplin Resources Pty Ltd has any material interest or entitlement, direct or indirect, in the securities of Atrum or any companies associated with Atrum. Fees for the preparation of this report are on a time and materials basis. Mr. Tamplin has not visited the Elan project area while Atrum coal personnel have conducted extensive field mapping over the Elan South Project during the 2017 exploration program. The (CP) was provided with access to the field geologists and the data collected.

The Company confirms that it is not aware of any new information or data that materially affects the Previous Announcements and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the Prior Announcements continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the Prior Announcements.

Coal Resources

The coal resources for Elan South documented in this report were estimated in accordance with the guidelines set out in the JORC Code, 2012. They are based on information compiled and reviewed by Mr Shaun Tamplin, who is a Member of the Australasian Institute of Mining and Metallurgy and is a full-time employee of Tamplin Resources Pty Ltd.

With more than 20 years of experience in open cut and underground coal mining, Mr Tamplin has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration to qualify him as a Competent Person as defined in the JORC Code, 2012 Edition.

Neither Mr. Tamplin nor Tamplin Resources Pty Ltd has any material interest or entitlement, direct or indirect, in the securities of Atrum or any companies associated with Atrum.

Mr Tamplin consents to the inclusion in the report of the matters based on the information, in the form and context in which it appears.

APPENDIX 1

- **JORC Code, 2012 Edition – Table 1**
- **Section 1 Sampling Techniques and Data – As of 30th September 2017**
- **Elan South Project – JORC Resource and Exploration Target (Previously known as Grassy North)**

Table 1 - Checklist of Assessment and Reporting Criteria (The JORC Code, 2012 Edition)

The following table provides a summary of important assessment and reporting criteria used for the Elan South Project in accordance with the Table 1 checklist in The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition). Criteria in each section apply to all preceding and succeeding sections.

Criteria	JORC Code explanation	Commentary
Sampling techniques		A considerable data base exists for the Elan South area with data acquired intermittently by Elan Coal Limited and the tenements previous holders since the 1950's. Data is sourced from a total of 11 boreholes, 16 Seam outcrops and 10 trenches. An additional 137 structural non-coal outcrop mapping points are utilized in the development of the models structural framework. Sample intervals within a seam were determined after examination of the geological and geophysical logs, and the sampling scheme adopted for surrounding drill holes. All coal seams were sampled. The standard down hole geophysical logging suite is Calliper, Natural Gamma and Density. Resources were determined on full seam sections. All cored samples have been crushed. Reverse circulation samples also crushed due to sampling approach. Subsequent analysis consisted of raw coal proximate, TS, and FSI. Not oxidized samples were then subjected to wash analysis including float sink at 1.40, 1.50 and 1.60 SG followed by a Proximate Analysis, Sulphur and FSI. The Clean Coal Composite, Proximate Analysis, Sulphur, FSI, Phosphurus in Coal, Fluidity, Dilatation, and Mineral Analysis of Ash. Full Petrography was conducted on selected composites Sampled depths and thicknesses were checked against the geophysical log and

Criteria	JORC Code explanation	Commentary
		adjusted accordingly.
Drilling techniques		Cored holes are PQ (85mm) and HQ (63.5mm) single tube core. Reverse Circulation holes were generally 125mm diameter. All holes have been drilled at a range of inclinations and directions in an attempt to intersect strata perpendicular to dip.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximize sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	In total, 3 PQ and 1 HQ boreholes were sampled for coal quality. One reverse circulation (RC) hole was also sampled. The majority of the data is on the main No. 2 Seam with 3 cored borehole intersections and one RC borehole sampled. There are only two occurrences each of the No. 1 and No. 4 Seams and these are poor samples due to low recovery. Coal recovery in cored holes was poor ranging from a low of 7% to a high of 90% for the identified seam groups. This is due to the extremely friable nature of the coal and considerable internal micro faulting within the seams. This behaviour and slim core coal recovery is typical of coals in this area. Coal intervals are logged at a moderate level of detail by describing its coal and waste intervals and lithology's. Coal brightness was logged on cored holes. Recent drill core is logged in accordance with Elan Coal procedure using a Company coding system. Coal intervals are logged in detail by describing its coal brightness profile. Linear coal recoveries are recalculated following adjustments using downhole geophysical logs made to sample length for broken core intervals. Observations suggest that core loss is concentrated on the more fragile bright coal bands. Consequently, samples with losses tend to have higher ash results than those with high recovery. No statistics have been performed to test this observation.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and*	Chips and cores are logged in the field and then corrected to geophysics. Corrected lithological and geophysical logs are available for all holes in hardcopy and softcopy.

Criteria	JORC Code explanation	Commentary
	metallurgical studies. • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.* • *The total length and percentage of the relevant intersections logged.*	Cored holes have moderately detailed lithological records. All holes were wireline logged if possible (i.e. not blocked). The minimum suite of logs is gamma, density, calliper and verticality. Coal and non-coal strata from chip and core descriptions encoded in a lithology database on a hole by hole basis. Coal seams correlated between holes with corrections to database made using full screen editor. The standard and level of detail is considered appropriate for mineral resource estimation. Trenches and Outcrops are treated as boreholes in regards to logging, survey and record keeping. All trenches have detailed logs with photographs also available for the most recent 2014 and 2017 trenches. No photos are available for earlier trenches. Recent (2014) cored holes have been sampled at a ply level and photographed at 1m intervals with samples stored in trays or clip lock bags. Chips are logged in the field and then corrected to geophysics. Coal brightness is not generally recorded on RC holes. Detailed sample records exist for all holes as well as corrected lithological and geophysical logs. Sampled intervals with unique sample numbers recorded for each ply where appropriate. Cored holes have detailed lithological records. All holes were wireline logged if possible (i.e. not blocked). The minimum suite of logs is gamma, density, verticality/deviation and calliper. Coal and non-coal strata from chip and core descriptions encoded in lithology database on a hole by hole basis. Coal seams correlated between holes with corrections to database made using full screen editor. The standard and level of detail is considered appropriate for mineral resource estimation. Total aggregate length of cored holes, trenches and outcrop exposure are 5600m, 500m and 1800m respectively.
Sub-sampling techniques and sample	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or*	Sample preparation, subsampling and quality control procedures ensured by the use of commercial labs employing recognised QA procedures and following International Standards for coal testing. All recovered coal samples were sent to GWIL - Birtley Coal Testing in Calgary for

Criteria	JORC Code explanation	Commentary
preparation	*dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximize representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	analysis. The GWIL - Birtley Coal Testing laboratory adheres to ASTM and ISO preparation and testing specifications and has Quality Control processes in place. The laboratory has participated in the International Canadian Coal Laboratories Round Robin Series (CANSPEX) since its inception, and their test results are consistently ranked in the preferred groupings. They are a member of the Coal Association of Canada. Samples sent to the laboratory are sub-sampled and reserve samples are placed in storage. Reserve samples are available for drilling completed since 2014. No reserve samples of holes drilled earlier are available.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	All coal analysis based on the accepted Australian and International standards at the time of analysis. The coal quality database is in excel format. The resultant database appears to have a valid range of data and exhibits sound regression relationships such as washability – ash. All laboratories involved in the sample analysis have a system in place of blind assaying and quality control. These records are maintained at the respective laboratories. Laboratories used to analyze coal cores from the Elan South deposit comply with Canadian and International Standards for sample preparation and coal quality testing, and are certified by the Coal Association of Canada (CAC). As part of CAC registration there is an obligation to complete all analysis in accordance with relevant round robin checks and other routine checking procedures to ensure they meet the required accuracy for each tests.
Verification of sampling and	• *The verification of significant intersections by either independent or alternative company personnel.*	Coal intersections used in the geological model were verified by geophysical measurements obtained by wireline logging, carried out by an independent contractor, supported by digital photographs. Coal intersection depths and seam

Criteria	JORC Code explanation	Commentary
assaying	• *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	correlations have been validated by independent reviewers/auditors and/or alternative company personnel (Database Geologist). Raw and washed coal quality data was validated using manual methods. Coal sample depths were compared to geophysical log depths to validate ply thickness and recovery values. Coal sample records relate to uncorrected depths while modeled borehole depths and thicknesses are based on intersections corrected to geophysics. Twinned holes are not generally used. Boreholes have been validated by Elan and Atrum staff geologists with spot checks conducted by Tamplin Resources. Drill hole collar, lithology and basic raw coal quality data is stored in a Vulcan database. All available source field records, lab reports, core photographs, survey data etc. are stored in electronic form on the Atrum Coal network.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	The declaration is based on Lidar topographic survey collected in 2005/6. No material surface disturbance has occurred since then. 2014 and 2017 borehole, trench and mapping collar data has been collected by hand held GPS. Earlier data was located by map reference. To minimise the impact of the collar level discrepancies, any drill hole collar heights that did not correspond with the Lidar RLs at those locations were adjusted to match the Lidar heights. This approach assumes that the collars field measurements for easting and northing are reliable. This assumption has not been verified, however, it is indirectly supported by the generally close correlation of GPS and map reference data. All data is recorded in an UTM co-ordinate system Zone 11.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation*	The Elan South Project covers an area of ~6,574 Ha and contains 11 boreholes, 16 Seam outcrops and 10 trenches. Data has been collected over the previous 60 years with the resultant dataset reflecting the standards and exploration targets of the time of the works. There is a bias in the dataset towards information on the No. 2 Seam which represents the principal open cut target. There are also high concentrations of data around shallower coal occurrences likely to be amenable to

Criteria	JORC Code explanation	Commentary
	procedure(s) and classifications applied. • *Whether sample compositing has been applied.*	shorter term open cut operations. This combined dataset exhibits a high level of variability in data distribution and reliability both in plan and stratigraphically. Many boreholes and trenches intersect only part of the sequence i.e. were spudded stratigraphically below one or more seams, or were not drilled/excavated deep/long enough to intersect lower or upper seams. The vast majority of drill holes have been geophysically logged, providing roof and floor seam picks. Raw, float and clean coal composite data stored in Excel database for each ply and working section (as analyzed). Ash, raw sulphur, FSI, ash chemistry, washability and clean coal composite data is also available for all seams, albeit based on samples with low recovery. No sizing data is available for the Project. The data spacing and distribution is considered by the Competent Person to be collectively sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. Where coal intersections have been sampled in multiple sections per seam, compositing of samples, on a length x RD basis, has been applied.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralized structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	The orientation of data in relation to geological structure is not believed to have introduced any sampling bias. The coal resource is contained either side of a major north striking reverse fault and this geology results in a marked anisotropy to the deposit with shallow coal occurring along the strike and either side of this feature. This east west anisotropy to the deposit is geostatistically significant, reasonably consistent and understood.
Sample security	• *The measures taken to ensure sample security.*	Samples have a unique sample number that is provided on tags in the bag, outside the bag and in separate digital and hard copy sample advice. Each item of advice lists project name, borehole, top and base of sample and sample number.

Criteria	JORC Code explanation	Commentary
		Given that coal is a commodity, samples are not considered to be at risk of salting. Reserves of samples drilled since 2014 are stored and maintained at the laboratories for further testing if necessary. Core samples were either delivered to the lab by the field geologist, courier or collected by lab personnel.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	The borehole database was created and validated by independent consultants (Dahrouge), Atrum and Elan geological personnel during 2013 to 2017. This dataset is partly based on historical drilling, trenching, and outcrop data collected from 1950 to 1976. Data from this period appears to be of a professional and consistent quality but the historic trench, or outcrop data used in resource estimation has not been directly confirmed. Data has been excluded where the data sets are incomplete or could not be constrained or confirmed in reports or government databases (Gorham, 2013). In 2017, the geological dataset and model was validated by the Competent Person, using reports, tables, contour plans and cross-sections.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a license to operate in the area.*	The Elan South Project consists of 4 coal lease applications encompassing an area of approximately 6,574 ha. The A13 coal agreements that contain the resources for this report are held by Elan Coal Ltd and are summarized in the Table below. It is important to note that the Elan South Project has previously been known as the Grassy North Project. **Lease Type** / **Lease Number** / **Area (hectares)** / **NTS Map Sheet** / **Date Recorded** A13 / 120019501 / 1541.8 / 82G16, 82G09 / 20-Jan-12 A13 / 120019502 / 1621.1 / 82G16, 82G09 / 20-Jan-12 A13 / 120019503 / 1729.9 / 82G16 / 20-Jan-12 A13 / 120019504 / 1681.1 / 82G16 / 20-Jan-12 Elan South Leases The coal leases applications were acquired on January 20, 2012 and are held by Elan Coal Ltd. Coal Lease Applications provide the right to exclusively explore the land within the boundaries of the Lease and are granted for a term of 15 years (with an option to extend at expiry). A coal lease does not grant surface rights; a surface lease or grant is required. Elan has not received or applied for a surface lease on the Property. Elan has not applied for legal access; however, the Property falls within the Rocky Mountain Forest Reserve, which is managed by the Alberta Government. As such, no road use agreements with private companies are required for access to the Property. A coal lease grants the right to explore the land within the boundaries of the lease. All 4 Elan South lease applications prescribe that “limited exploration may

Criteria	JORC Code explanation	Commentary
		be permitted under strict control and for only underground or insitu development". A majority of the project is located in an area that has been classified as Category 2 in accordance with the Coal Development Policy for Alberta. Surface mining is not traditionally considered in Category 2 areas either because it is an area where infrastructure is inadequate to support mining activities or it is an area associated with high environmental sensitivity. Coal leases are also subject to the following legislation and policies: • **Mines and Minerals Act** Parts 2 and 3 of the Mines and Minerals Act pertain specifically to coal leasing. • **Mines and Minerals Administration Regulation** • **Coal Conservation Act** A coal lessee requires a Mine Permit and a Mine License to develop a mine in the location of a lease. Approval for development and mining is administered by the Alberta Energy Regulator (AER). • **1976 Coal Development Policy for Alberta** • Integrated resource plans, policies, and any local restrictions set by the Government of Alberta under the Mines and Minerals Act and other legislation. • Information Letters relating to Mineral Rights Acquisition and Mineral Rights Tenure The land that comprises the Property is Crown Land and the Property falls within the Rocky Mountain Forest Reserve, which is managed by the Alberta Government. As such, no road use agreements with private companies are required for access to the Property. Land use in the local area is dominated by recreational, traditional, agricultural and forestry activities.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	Coal was first noted in the district around 1845 by Father Pierre-Jean DeSmet, a Jesuit missionary. Michael Phillips made note of coal exposures along Elk River in 1873 and sent samples to Dr. G.M. Dawson of the Geological Survey of Canada, who later evaluated the coal deposits as part of a mapping program in 1878.

Criteria	JORC Code explanation	Commentary
		The extensive history of coal mining in the Crowsnest Pass area began in 1898 at Fernie BC, and in 1901 at Frank, Alberta. The most proximal historic mining location is the Grassy Mountain Open Cut, located about 5 km to the south along the same strike of the Elan South Project. This small open cut was operated by West Canadian Collieries from 1947 to 1960 and extracted approximately 3.5Mt of product. During the late 1940s and early 1950s, Western Canadian Collieries undertook dozer assisted surface geological mapping of the Elan South area which resulted in the 16 measured “outcrop” sections that are included in the Resource Estimate. NorthStar Energy Corporation drilled four HQ (63.5mm core) Coal Bed Methane gas wells within the Project boundaries in 2001. These holes targeted the deeper coal seam occurrences and are useful in establishing the regional structural interpretation at depth. All holes were geophysically logged and some limited coal quality data is also available. In 2014, Elan Coal in partnership with Kuro Coal completed 4 PQ/HQ boreholes, 3 RC open holes and 7 costean trenches. The exploration was principally conducted in two areas proximal to prospective areas identified by the earlier Western Canadian Colliers Mapping. The 2014 PQ/HQ Drilling program completed a total of 454 meters in four holes. Thirty three coal samples were collected and later composited into logical seam units in accordance with the geophysical logs for each hole. Coal recovery was poor ranging from a low of 7% to a high of 90% for the identified seam groups. This is due to the extremely friable nature of the coal and considerable internal micro faulting within the seams. This behaviour and slim core coal recovery is typical of coals in the area. The Reverse Circulation (RC) Drilling program completed a total of 385 m in three holes. The approach here was to drill two of the holes as pilot drill holes and use the geophysical logs to identify depths to the main seam units. Knowing the approximate depths; a third hole was drilled and cutting samples were

Criteria	JORC Code explanation	Commentary
		collected over the target seam intervals. This approach resulted in an improved coal recovery, however, sampling around seam boundaries with RC drilling techniques is not precise and some contamination of coal samples is to be expected. In 2017 Atrum Coal supervised a limited exploration program consisting of three trenches and field mapping. In September 2013, Dahrouge Geological Consulting estimated an Exploration target for Elan South of 250-254 million tonnes on behalf of Kuro Coal Ltd. This estimate formed part of a larger NI 43-101 Report that encompassed all of the Elan Coal tenements (of which Elan South makes up the southern-most area).
Geology	• *Deposit type, geological setting and style of mineralization.*	The Jurassic-Cretaceous Mist Mountain Formation (Kootenay Group), which contains the major coal deposits in the Front Ranges of south eastern British Columbia and south western Alberta, was deposited within a broad coastal plain environment as part of a north- to northeast-prograding clastic wedge along the western margin of the Jurassic epicontinental Fernie Sea during the first of two major episodes of the Columbian Orogeny. The Mist Mountain Formation consists of interbedded sandstone, siltstone, mudstone and coal up to 1000 m thick and is interpreted as deltaic and/or fluvial-alluvial-plain deposits. Regionally, economically important coal seams occur throughout the succession. Regionally, the seams are up to 18 m thick and vary in rank from south to north, from high volatile bituminous to semianthracite. Progressive south to north changes in depositional environments causes the Mist Mountain Formation to grade into the contemporaneous but mainly coal-barren Nikanassin Formation to the north of Clearwater River (latitude 52°). The Mist Mountain Formation at Elan South contains a multi-seam resource consisting of a cyclic succession of carbonaceous sandstone, mudstone, siltstone, coal, and some conglomerate. This formation is directly overlain by the massive Cadomin Conglomerate which is a readily recognizable marker horizon throughout the area. The Cadomin Formation, a resistant, chert-pebble

Criteria	JORC Code explanation	Commentary
		conglomerate up to about 100 m thick (although generally much thinner). The Cadomin Formation is overlain by continental deposits consisting of interbedded dark mudstone, siltstone and sandstone of the Gladstone Formation (Blairmore Group). There are at least three major economic coal horizons in the Mist Mountain formation at Elan South. The uppermost No. 1 Seam occurs immediately below the Cadomin and ranges in thickness from 1 m to 4 m. The No. 1 Seam may be eroded by the overlying conglomerate in some places. The thick No. 2 Seam is typically 35 m below the No. 1 and the ranges in thickness from 5 m to 15m. The lower No. 4 Seam is typically 30 m below the No. 2 and consists of multiple coal plies up to 1m thick with in rock parting material. These seams were mined on the Grassy Mountain open pit mine which 5km to the south of the Project. The Elan South coals are considered a Medium Volatile A class coal that could be marketed as low ash thermal, PCI and hard coking coal. Washability analysis of the raw coal samples demonstrates a clean product in the 9.0-10.5% ash range can be generally achieved at a cut point of SG1.50. The product coal is low in phosphorous (~0.015) and sulphur (~0.60) and exhibits Free Swelling Index (FSI) of approximately 7 (@ CF 1.50 separation gravity). **Structural Setting** The Elan South Project is located within the Rocky Mountain Foreland Thrust and Fold Belt, within a succession of generally west-dipping thrust faults and associated folds with predominantly west-dipping axial surfaces. The strata have been strongly folded and faulted, resulting in sediments and coal zones repeated in parallel north south striking bands. Coal deposits of this type are generally characterized by linear strikes along thrusts and associated tight folds, some with steeply inclined or overturned limbs. Tectonic deformation of coal measures is the major factor that controls the present areal extent, thickness variability, lateral continuity, and geometry of coal beds at Elan South. The strata is characterized by broad upright to overturned

Criteria	JORC Code explanation	Commentary
		concentric folds, cut and repeated by major to minor thrust and tear faults, and late extensional faults. Extensive shearing and structural thickening and thinning of coal beds in the cores of flexures are common in highly deformed regions. Major faults have resulted in repetition of the Kootenay Group and have brought coal measures of the Mist Mountain Formation to depths accessible to modern mining methods. Although extensive deformation of coal-bearing strata has enhanced the economic potential of the region, it has also complicated mining and exploration. Bedding slip surfaces, joints and cleats, and extension, contraction and wrench faults have been recognized as the fundamental fabric elements within many of the major coal beds of the Kootenay Group. Notably, in other areas, shearing of coals has resulted in increased ash yields, locally promoted in situ oxidation and resulted in unpredictable roof conditions, making underground mining difficult. Faulting and folding segments the Elan South coal deposit into discrete structural domains of varying styles and complexities. In this context, the Elan South Project has been divided into 5 domains bounded by 4 major thrusts that dip to the west at angles of 30°-69°. Little is known about the detailed geometry of the thrusts other than their surface expression. Currently, the thrusts are modelled as single continuous planes with dips of 30-70°; however, in reality they are likely to consist of a wide zone of intense deformation where coal seams have been thickened in response to cataclastic flow of coal from limbs into the hinge areas of tight folds along the flanks of the thrust. The Elan South Resources are located in two areas on either side of the FB2 and FB3 thrusts which are two of the 4 major thrusts that divide the project into structural domains. The FB2 thrust is also known as the Turtle Mountain Thrust, whereas the FB3 is interpreted as a localized low angle splay thrust from the FB2. The FB2 thrust dips to the west at approximately 65° whereas the FB3 is interpreted to exhibit a 45° westerly dip. Strata on the western side of the FB2 thrust generally dips at 65° to the west sub-parallel to the thrust plane. Field mapping suggests that the eastern side of the FB2 thrust is characterised by regional syncline between the FB2 and FB3

Criteria	JORC Code explanation	Commentary
		thrusts with a smaller parasitic anticline immediately adjacent to the eastern edge of the FB2 thrust. This latter feature is probably a fault flexure feature and its presence along with field mapping data suggests that the strata proximal to both sides of the thrust is highly complex, folded and possibly overturned in places. The complex interplay of thrusting, folding and high relief topography controls the distribution of coal seams and their associated subcrops at Elan South. The Elan South resources occur in a general north-south direction along the strike of the FB2 fault and in the syncline between the FB2 and FB3 faults. Currently two separate resource areas along strike have been defined with continuity between these areas yet to be shown. Continuity of the coal seams along strike and the proximity of the coal to surface, if proven, would facilitate an expanded Resource in the future. That said, the density of drilling and supplemental data is currently insufficient to indicate continuity of the deposit along strike beyond the currently defined resource areas. No intrusions have been mapped or interpolated to occur within the Elan South Project. The Geological Survey of Canada Paper 88-21 outlines criteria that may be used to classify coal deposits on the basis of "geology type" (degree of geological complexity) and "deposit type" (potential mining methods). Based on these criteria, Elan South is probably best classified as a complex, surface mineable deposit as the deposit has been subjected to relatively high levels of tectonic deformation with tight folds and steeply inclined or overturned limbs common. Individual fault-bounded plates generally retain normal stratigraphic sequences although coal seam thicknesses are commonly structurally thickened or thinned.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* ○ *easting and northing of the drill hole collar* ○ *elevation or RL (Reduced Level – elevation*	The GN0917 geological model was constructed using Vulcan software (version 10.1) based on an isis database containing 11 boreholes, 16 Seam outcrops and 10 trenches. An additional 137 structural non-coal outcrop mapping points are utilized in the development of the models structural framework. All holes, trenches and outcrops have been lithologically logged, with coal

Criteria	JORC Code explanation	Commentary
	above sea level in meters) of the drill hole collar ○ *dip and azimuth of the hole* ○ *down hole length and interception depth* ○ *hole length.* • *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	brightness logs for cored holes All major seams are correlated between holes with a level of confidence in accordance with their resource status (Indicated or Inferred). Structural data contained in Vulcan database; database updated with all exploration data, mapping pickups and other relevant data. Coal quality data contained in Excel but linked to structural database by both roof and floor picks and seam name. All coal quality samples taken at a ply by ply level for proximate analysis and then composited into working sections for subsequent working section analysis, washability and clean coal composites. In total, 3 PQ (85mm core) and 1 HQ (63.5mm core) boreholes were sampled for coal quality. One reverse circulation (RC) hole was also sampled. The majority of the data is on the main No.2 Seam with 3 cored borehole intersections and one RC borehole sampled. There are only two occurrences each of the No.1 and No. 4 Seams and these are poor samples due to low recovery. Coal recovery in cored holes was poor ranging from a low of 7% to a high of 90% for the identified seam groups. This is due to the extremely friable nature of the coal and considerable internal micro faulting within the seams. This behaviour and slim core coal recovery is typical of coals in this area. All recovered coal samples were sent to GWIL - Birtley Coal Testing in Calgary for analysis. The GWIL - Birtley Coal Testing laboratory adheres to ASTM and ISO preparation and testing specifications and has Quality Control processes in place. The laboratory has participated in the International Canadian Coal Laboratories Round Robin Series (CANSPEX) since its inception, and their test results are consistently ranked in the preferred groupings. They are a member of the Coal Association of Canada. The PQ/HQ and RC testing protocol for the 2014 exploration was comprehensive and the testing procedure is summarized as follows:

Criteria	JORC Code explanation	Commentary
		1. *Weigh and air dry samples for analysis* 2. *Crush to minus 12.5 mm and screen the samples at plus/minus 0.25 mm. Cut a representative the raw coal head sample and assay for full Prox and Sulphur, LT and FSI.* 3. *Report the raw head results.* 4. *On the plus 0.25mm fraction, conduct float sink at 1.40, 1.50 and 1.60 SG. Assay for Prox, Sul and FSI* 5. *On the minus 0.25 mm assay for Prox, Sul and FSI* 6. *On the Clean Coal Composite, full Prox, Sul, FSI, P in Coal, Fluidity, Dilatation, and Mineral Analysis of Ash* 7. *Full Petrography on selected composites* The attached table summarizes exploration data available by program.
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	Coal intersections may have been sampled in multiple sections per seam, so compositing of density is aggregated by volume. Proximate analysis results, sulphur and washability are aggregated by mass. Clean coal results are aggregated by the sum product of yield and mass. These approaches are industry standards. Where quoted coal quality is for the full seam. Grade cut-offs have not been applied to exploration results in the database.
Relationship between mineralization widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralization with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width*	All thicknesses in the geological model are apparent thickness. Given the deposits steep seam dip there is a significant differential between apparent and true thickness in a vertical borehole. Many of the boreholes have been been inclined in an attempt to intersect strata perpendicular to the strata dip. Both down hole and interpreted true lengths are reported. The interpreted true

Criteria	JORC Code explanation	Commentary
	not known').	lengths are based on accuracy of the seam dip model which is commensurate with the Resource classification.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	See Figures 1 to 10 and Tables 1 to 7.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	There is no preferential reporting of results. The Elan South geological model has two primary purposes, a tool for performing JORC resource estimates over the Elan South tenements, and as a tool for targeting future exploration. This work was completed in mid-2017 and resulted in the establishment of the GN0917 model. Data has been extensively cross referenced against raw records. Key validation tools include the generation of cross sections and isopach plans and generic Vulcan borehole validation checks. No material information has been excluded and outputs from the model honor data. Average values have been included for resources reported here and whilst some outlying values may exist the average values are considered representative of Coal Resources.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock*	No material potentially deleterious or contaminating substances have been identified. A sizable field mapping dataset exists across the Elan South tenement which has been utilized to develop and refine the structural framework of the geological interpretation. Aerial and topographic interpretation clearly demonstrate the north south striking

Criteria	JORC Code explanation	Commentary
	characteristics; potential deleterious or contaminating substances.	regional geology of the deposit as it relates to the north south striking westerly dipping thrust belts. The massive Cadomin Conglomerate, which directly overlies the coal bearing stratigraphy of the Mist Mountain formation is a readily recognizable marker horizon throughout these thrust belts.
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Indicated and Inferred resources can be increased with further drilling as the current Resource areas are open along strike to both the north and south. The key requirement to further define and refine both the Resource Estimate and Exploration Target is the acquisition of more reliable coal quality data. Given, the historic poor recovery of single HQ and PQRC drilling it is recommended that the project acquire both wide diameter (200mm) and triple tube PQ drill samples for raw, sizing and washability analysis. Near surface trench samples may also be useful for some raw properties such as ash and possibly density depending on the degree of weathering.

- Section 3 Estimation and Reporting of Mineral Resources

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

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	All points of observation meet the following criteria • A geophysical (wireline) log, to allow confirmation of linear seam recovery and lithological logging; • A direct observation from a outcrop, trench or test pit There is basic comparability of data for parameters such as ash and sulphur and FSI values. It is considered that there is sufficient coal quality data to characterise and evaluate the deposit at the differing resource categories. All laboratories involved in the sample analysis have a system in place of blind assaying and quality control. Their scope has been to ensure the maintenance of acceptable levels of accuracy and precision in the reporting and process selection. They have also audited reported results and ensured that laboratory losses are allocated appropriately. These records are maintained at the respective laboratories. Open holes chips are logged in the field and then corrected to geophysics. Borehole data from virtually all data points has been recorded as English listed logs. The majority of boreholes have been geophysically logged with a suite of downhole tools. All major seams are correlated between holes with a level of confidence in accordance with their resource status. All thicknesses in the geological model are apparent thickness. Boreholes are a mixture of vertical and inclined holes. Verticality has been applied to the boreholes in the model. Structural data is contained within a Vulcan borehole database. The database was updated with all available exploration data and other relevant data as of September 2017 Base of weathering surface defined by a combination of visual estimates and proximate analysis on cored samples.

Criteria	JORC Code explanation	Commentary
		Raw geological data fully transferred to Vulcan database has been carried out with diligence using best geological practice. Data has been extensively cross referenced against raw records. Key validation tools include the generation of cross sections and isopach plans and generic Vulcan borehole validation checks. All model releases are formally documented.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	No site visits have been undertaken by the Competent Person (CP). Atrum coal personnel have conducted extensive field mapping over the Elan South Project during the 2017 exploration program. The (CP) was provided with access to the field geologists and the data collected.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	GN0917 Geological Model Details. • Model in UTM co-ordinate system – Zone 11 • Grid origin Structural model: 682500E, 5511150N. Grid extent 695000E, 5530000N. • Grid mesh structural model: 25m x 25m mesh • Vulcan Structural and Coal Quality Database : GN0917.geo.isis The database has been manually and electronically interrogated to produce Vulcan database (.isis) files representing x,y coordinates and data values for structural parameters such as depth to coal seam roof and floor. The computer generated models of the Elan South deposit were generated using Maptek's Vulcan Software V10.1 Resources have been estimated within the Elan South tenements using Vulcan block modelling software within vertical sided polygons. The model used geological data from drilling, trench, outcrop and topographic data as at the end of September 2017. The stratigraphic model was created using Vulcan software with a grid size of 25m. Structurally, the deposit is moderately understood in terms of the overall regional

Criteria	JORC Code explanation	Commentary
		framework and an alternative interpretation is unlikely on a regional basis. An alternative interpretation on a localized basis is possible. The complex interplay of thrusting, folding and high relief topography controls the distribution of coal seams and their associated subcrops at Elan South. This interplay of complex variables results in the level of model and Resource uncertainty increasing at a localized level, particularly in Inferred Areas. The Elan South resources occur in a general north-south direction along the strike of the FB2 fault and in the syncline between the FB2 and FB3 faults. Currently two separate resource areas along strike have been defined with continuity between these areas yet to be shown. Continuity of the coal seams along strike and the proximity of the coal to surface, if proven, would facilitate an expanded Resource in the future. That said, the density of drilling and supplemental data is currently insufficient to indicate continuity of the deposit along strike beyond the currently defined resource areas. Coal quality parameters are not modeled due to insufficient data. Relative density is assumed to be 1.45gm/cc at nominal 5% moisture
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	The tenements comprising Elan South Project cover an irregular shaped area 13km north south and 4km east west. This statement covers the coal resources within the Elan South leases as well as an Exploration Target for areas proximal to the Resource Areas. Resources and Exploration Targets estimated in October 2017 for the period ending 30th September 2017. Resources and Exploration Targets are limited to coal tenement boundaries; subcrop against base of weathering; a minimum coal thickness of 0.3 m, a maximum depth of 300m and a cumulative strip ratio of 20:1bcm/t. This approach approximately reflects existing practical recovery limits for thin seam open cut mining.
Estimation and	• *The nature and appropriateness of the estimation technique(s) applied and key*	The geological model was developed by the Competent Person using Maptek Vulcan software. The current estimate supersedes the September 2013, NI 43-101 Report

Criteria	JORC Code explanation	Commentary
modeling techniques	*assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterization).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of*	prepared by Dahrouge Geological Consulting on behalf of Elan Coal Limited. This report detailed a 252Mt exploration target for the entire Elan South Project. No resources were declared for Elan South in the 2013 Report. The GN0917 model updates the previous geological model released by Dahrouge and used for the previous Exploration Target Estimate. The new model is based on and incorporates the GN0917 geological database which includes additional exploration works conducted in 2014 and 2017. The geological model is a grid model; however, the site utilizes a HARP block model for all its resource reporting requirements. The stratigraphic model was created using Vulcan software and a grid size of 25m. Structural data contained in Vulcan database was updated with all exploration borehole and coal quality data and other relevant data as of September 2017. The model is an update of the 2013 Exploration Target model and incorporates changes based on the following key areas. • In 2014, Kuro Coal in partnership with Elan Coal completed 3 PQ (85mm core) boreholes, 1 HQ (63.5mm core) borehole, 3 RC (Reverse Circulation) open holes and 7 costean trenches. The exploration was principally conducted in two areas proximal to prospective areas identified by the earlier Western Canadian Colliers Mapping. The 2014 PQ/HQ Drilling program completed a total of 454 meters in four holes. Thirty three coal samples were collected and later composited into logical seam units in accordance with the geophysical logs for each hole. Coal recovery was poor ranging from a low of 7% to a high of 90% for the identified seam groups. This is due to the extremely friable nature of the coal and considerable internal micro faulting within the seams. This behaviour and slim core coal recovery is typical of coals in the area. Improved recovery is likely to result by utilizing triple tube drilling in future exploration programs. • The RC Drilling program completed a total of 385 m in three holes. The approach here was to drill two of the holes as pilot drill holes and use the geophysical logs to identify depths to the main seam units. Knowing the approximate depths; a third hole was drilled and cutting samples were collected over the target seam intervals. This approach resulted in an improved coal recovery, however, sampling around seam boundaries with RC drilling

Criteria	JORC Code explanation	Commentary
	reconciliation data if available.	techniques is not precise and some contamination of coal samples is to be expected. • In 2017 Atrum Coal supervised a small exploration program consisting of three trenches and field mapping. The geological model utilized Mapteks Vulcan software. The model outputs grids for each structural variable. There was insufficient data to construct a detailed coal quality model and in this context the coal quality variables detailed in the Resource and Exploration Target are based on average values. Interpolation of missing structural data utilized Vulcans FIXDHD module. Seams were only interpolated outside hole extents, thus ensuring all non-logged seams were pinched to a zero thickness. Field mapping data was incorporated into the model as surface control points using the No. 2 Seam as a principal reference surface. All structural data was interpolated within 5 separate structurally independent domains with each domain bounded by 4 major reverse faults. After interpolation, seam structure points were modeled using Mapteks hybrid modeling method to create five separate domainal models. This method is a triangulation based approach (trend order=2, smoothing=10). The declared resources are contained either side of the FB2 and FB3 thrust and are contained in the FB2 and FB3 domainal structure models. Seam thickness was modeled with a triangulation algorithm (trend order=0, smoothing=10, maximum triangulation side length=5000m). Coal quality parameters are not modeled due to insufficient data. Relative density is assumed to be 1.45gm/cc at nominal 5% moisture which is in line both average and typical coal quality information. The GN0917 geological model incorporates topography as of September 2017. Topographic data is acquired from a LiDAR survey undertaken over the whole project during 2005. No material surface disturbance has occurred since this time. Base of weathering is assumed to be 15m total depth below topography. This depth is based on borehole data with individual weathering estimates of 10m to 15m.

Criteria	JORC Code explanation	Commentary
		There are no records or evidence of surface or underground mining on the tenements which would dilute Resources or Exploration Targets. There are no material concentrations of deleterious elements of economic significance. There is no assumption of selective mining. Full coal thickness roof to floor is modelled for all seams. The complex and undulating character of the deposit makes it necessary to utilize interpreted geological controls such as dummy boreholes and extrapolated survey data in order to appropriately characterize the resource. The geological model is validated by generating and inspecting reports, tables, cross sections, contour plans and comparisons with posted drill hole values. Resources are limited to coal tenement boundaries; subcrop against base of weathering; a minimum coal thickness of 0.3 m, a maximum depth of 300m and a cumulative strip ratio of 20:1bcm/t. This approach approximately reflects existing practical recovery limits for thin seam open cut mining.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	The basis of the tonnage estimate is in-situ moisture (Mis). In-situ moisture is estimated to be 5%
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	Resources are limited to coal tenement boundaries; subcrop against base of weathering; a minimum coal thickness of 0.3 m, a maximum depth of 300m and a cumulative strip ratio of 20:1bcm/t. This approach approximately reflects existing practical recovery limits for thin seam open cut mining.
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating*	See Cut-off Parameters and estimation and modeling techniques.

Criteria	JORC Code explanation	Commentary
	Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	Average values have been included for resources reported here and whilst some outlying values may exist the average values are considered representative of Coal Resources. There is no known material data which would place at risk the assumption that the coal can be mined cleanly and/or blended and/or washed to a saleable specification.
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental*	The land that comprises the Property is Crown Land and the Property falls within the Rocky Mountain Forest Reserve, which is managed by the Alberta Government. As such, no road use agreements with private companies are required for access to the Property. Land use in the local area is dominated by recreational, traditional, agricultural and forestry activities. A stakeholder consultation program was undertaken by Elan Coal during the 2014 exploration program and more recently in 2017. The consultation program has been ongoing and has evolved as the project has developed to its current stage. Much of the consultation has been associated with obtaining licences and permits required for exploration works. Local, State and Commonwealth Government agencies have been involved in this consultation: Elan has consulted with the Registered First Nation Parties and other members of the First Nation community in regard to local community and cultural heritage management issues and how they may be impacted by future exploration works.

Criteria	JORC Code explanation	Commentary
	assumptions made.	Several Aboriginal groups are located within a 100km radius of the Project in both BC and Alberta. The First Nation reserves in Alberta within 100km of the Project include Peigan Timber Limit 147b, Piikani Reserve, Blood 148, Blood Timber Limit 148a, and Eden Valley 216. In British Columbia, First Nation reserves within 100km include the Bummers Flat 6, Kootenay 1, St Marys 1a, Isidore's Ranch 4, Cassimayook 5, and Tobacco Plains 2. The closest populated First Nation reserve community to the Project is Piikani Reserve, approximately 45km to the east. The provincial border between Alberta and British Colombia is located approximately 17km west of the project. The National Border between Alberta and Montana, USA is located approximately 75km south of the project. The Project falls within the southwest limits of the South Saskatchewan Regional Plan, which came into effect September 2014 and was established to manage the cumulative effects of development on the environment (including air, water, land, and biodiversity) across southern Alberta and to ensure that the long term quality of the meets provincial objectives. There are several strategies within this objective, including, but not limited to: minimizing the amount of land required for new developments, using already-disturbed lands, and progressively and timeously reclaiming previously developed lands that are no longer required. The southern and eastern most portions of the project are located within a Mountain Goat and Sheep Range. In these areas, efforts will be required to be made to avoid disturbances that may have a direct or indirect adverse effect and to avoid permanent alteration of habitat. . The entire Elan South Project is located within a Grizzly Bear Protection zone which is declared to provide and preserve either core or secondary grizzly bear habitat.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.*	The basis of the tonnage estimate is in-situ moisture (Mis). In-situ moisture is estimated to be 5% and this assumption is based on comparison with similar nearby deposits containing similar rank coal. Relative Density (Tonnage) estimated at 5% moisture. .

Criteria	JORC Code explanation	Commentary
	• *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	No Measured Resources are declared for the Elan South Project. Indicated Resources were supported by points of observation up to 200m apart. Inferred Resources require a spacing of less than 400m. Points of observation include geophysically logged cored holes with analysis, test pits, outcrops and open boreholes with geophysical logs. Consideration of the confidence to predict seam continuity, thickness and coal quality have been incorporated in the positioning of resource category limits, in addition to data spacing criteria. Resources are limited to areas with a cumulative strip ratio to the No. 4 seam of less than 20:1 bcm waste/insitu coal tonne and a total depth of less than 300m. In this context resources are considered to be potentially economically extractable via open cut mining. The data spacing and distribution is considered by the Competent Person to be collectively sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. All coal resources in the Elan South leases have open cut potential. Drill holes are spaced closely enough for coal seam continuity and quality to be assumed justifying Indicated status on the No. 2 Seam in one small area in the northern domain. All other seams (No. 4 and No. 1) and other areas have spacing's adequate for Inferred Resources. Location of individual coal seam subcrops are only approximate and would require additional drilling if shallow seam mining were to take place. The extent of major faulting and coal washouts may negatively affect the coal resource tonnage for each affected coal seams. Other minor faults with small throws

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		are likely to exist throughout the deposit.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	No formal audits or reviews have occurred. The model was created by the C.P. on a database prepared by Kuro Coal Limited and Elan Cal Limited. The resultant model was validated by C.P. in order to prepare this statement.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	Structurally, the deposit is moderately understood and an alternative interpretation is possible. The main factor affecting coal seam continuity is the interplay of faulting, folding, seam dip, depth of weathering and surface topography. Seams show a highly variable thickness which reflects depositional and structural variations as well as the localized thickening of coal seams which occur in the apex of folds and adjacent to reverse faults Cored drilling on the Elan South Project has exhibited poor core recovery placing the coal quality estimates at some risk. Indicated resources are limited to the No. 2 Seam in the northern area as this is the only area that has multiple cored intersections. The coal quality of the southern resource area are mostly based on Reverse Circulation (RC) drilling samples. The approach here was to drill two of the holes as straight drill holes and use the geophysical logs to identify depths to the main seam units. Knowing the approximate depths; a third hole was drilled and cutting samples were collected over the target seam intervals. While recovery volumes were certainly higher than conventional coring; the actual seam boundaries are not precise. Further, the cuttings recovered are very fine which limits any meaningful washability size testing. The acquisition of a more reliable and expanded coal quality dataset is the most important criteria to any future expansions to the Elan South Resource Estimate. A majority of the Elan South project tenements are located areas that has been classified as Category 2 in accordance with the Coal Development Policy for Alberta.

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		Surface mining is not traditionally considered in Category 2 areas either because it is an area where infrastructure is inadequate to support mining activities or it is an area associated with high environmental sensitivity. The complex geology of the deposit is likely to preclude Undrground Mining techniques. All remaining coal resources in the Elan South tenements have open cut potential. Resources have a moderate to low level of confidence. Drill holes are spaced closely enough for coal seam continuity and quality to be assumed justifying Indicated status on the No. 2 Seam in one area in the north. All other areas and seams exhibit spacing's that are only adequate for Inferred Resources. The extent of coal washouts may affect negatively the coal resource tonnage for each affected coal seam. Significant faulting and folding is likely to exist throughout the deposit but is unlikely to impact global estimates.