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January 6, 2006

05-1413-036

Cumberland Resources Ltd.
Suite 950, One Bentall Centre
505 Burrard Street
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Attention: Mr. Jim Koski

RE: GEOCHEMICAL CHARACTERIZATION OF MEADOWBANK AIRSTRIP MATERIALS

Dear Mr. Koski:

Golder Associates Ltd. (Golder) has prepared the following letter report, outlining the geochemical characteristics of the Pioneer airstrip at the Meadowbank Gold Project in Nunavut, at the request of Cumberland Resources Ltd. (Cumberland). As part of a mine site material characterization program developed for the Meadowbank Project, samples of the rock and till to be used in the construction of the Pioneer airstrip were analyzed for chemical composition, acid rock drainage (ARD) potential and metal leaching (ML) potential, prior to construction (Golder, 2003 and 2005). At present, the construction of this airstrip is partially complete, but has been terminated for the season. This letter report presents the results of the previous analyses, as well as plans for additional geochemical work, including further sampling and testing of airstrip construction materials, and airstrip drainage water quality monitoring.

1.0 BACKGROUND

As part of the airstrip construction, approximately 2,200 m³ (approximately 5,900 tonnes) of intermediate volcanic (IV) rock and approximately 44,200 m³ (approximately 81,800 tonnes) of till have been excavated. As shown on the as-built drawing of the airstrip (Figure 1-1), intercept ditches have been constructed to divert runoff water away from the working area of the airstrip, and collector ditches have been constructed to



channel runoff water from the construction zone, into five settling ponds. In addition, sediment fences have been installed.

To complete the airstrip, approximately 46,700 m³ of additional fill will be required. The quality of the material excavated from the airstrip area thus far is not adequate from a geotechnical perspective. Consequently, it is anticipated that IV rock, or a combination of IV and ultramafic (UM) rock, excavated within the first year of pre-production from the Third Portage starter pit will be used for the balance of the required fill, along with approximately 5,000 m³ of rock from the ridge to the northeast of the current airstrip alignment, or from underneath the proposed crushed ore stockpile area (Koski, 2005 and Thiele, 2005).

A total of three overburden (till) samples and ten rock samples (all IV), collected from a previous alignment of the airstrip (which included the rock ridge that is to be blasted for surfacing material), along with 59 samples collected from the proposed Third Portage starter pit (including 24 IV samples, 19 iron formation (IF) samples, and 16 UM samples) have thus far been characterized in terms of chemical composition, and ARD and ML potential (Golder, 2003 and 2005). Based on current estimates of the rock quantities and lowest bench elevation to be mined within the first year of pre-production (MRDI, 1999; AMEC, 2005), six of the 59 starter pit samples (including one IV sample, four IF samples and one UM sample) are within the maximum depth from which the rock to be used for the airstrip construction will be excavated. Figure 1-1 shows the locations from which the till and rock samples from the airstrip area were collected. The till and starter pit rock samples were selected from materials available from drilling, while the rock samples from the airstrip area were collected from surface outcrops. No samples were collected from the proposed crushed ore stockpile area, as part of these studies.

2.0 ANALYSES

All of the rock and till samples previously characterized by Golder (2003 and 2005) were submitted to the Canadian Environmental and Metallurgical Inc. (CEMI) laboratory in Vancouver, BC, for the following analyses: elemental solid phase chemistry, and acid-base accounting (ABA). All of the till samples and a subset of the rock samples were also submitted for shake flask extraction (SFE), and the till and starter pit rock samples were submitted for whole rock analysis. CEMI subcontracted ALS and Assayers Canada to conduct the aqueous chemistry and portions of the ABA analyses, respectively. The following sections provide a summary of the analytical procedures used. For comprehensive descriptions of geochemical characterization methodologies related to mining materials, the reader is referred to standard treatises (e.g., Price, 1997; Sobek, 1978).

2.1 Whole Rock Analysis

Whole rock analysis was conducted by lithium metaborate fusion, followed by nitric acid digestion and ICP-OES analyses of the resulting solutions. This analysis provides total elemental weight percent compositions as oxides for the major rock-forming elements (e.g., Na₂O, CaO, SiO₂, etc.), and as elemental concentrations for selected trace metals. Whole rock analysis is used to determine the general characteristics of different lithologies or material types.

2.2 Elemental Solid Phase Analysis

A multi-element ICP scan for trace metals using a four-acid digestion (HNO₃, HCl, HClO₄ and HF) was performed to characterize trace metal contents. Arsenic concentrations were evaluated by a single element assay. A number of constituents included in the standard ICP scan were also analyzed through whole rock analysis. Although multi-acid digestion of samples prior to ICP analysis is very aggressive, the process may leave trace amounts of solids undissolved and therefore not analyzed. The whole rock analytical results are thus considered to be more representative of the actual concentration of major elements.

2.3 Acid Base Accounting

ABA analyses were performed to predict the ARD potential of the rock and till samples. Analyses included determination of the following parameters: paste pH, acid potential (AP) through sulphur species analysis (analysis of total sulphur, sulphate sulphur and determination of sulphide sulfur by difference), and neutralization potential (NP). NP is a bulk measurement of the acid-buffering capacity of a sample, which is provided by various minerals of different reactivities and effective neutralization capacity. Because the type and occurrence of neutralizing minerals present in the sample will have a determining effect on whether the ARD potential of a sample will be realized, NP was evaluated using three different analytical techniques to more accurately determine the amount of available NP:

Modified Sobek NP: Represents the bulk NP of the sample, including contributions from some reactive aluminosilicate minerals, if present. It is calculated from the amount of base consumed to neutralize acid remaining from the acid-digested sample. This test was performed on all samples.

Carbonate NP: Represents the NP available from carbonate minerals, including siderite and other divalent metal carbonates (which provide no net neutralization). It is calculated

based on the total inorganic carbon content of the sample, assuming all inorganic carbon is in the form of carbonate minerals. This test was performed on all samples.

Siderite NP: Represents the bulk NP of the sample excluding minerals that provide no net neutralization potential (such as siderite) but including slow-reactive aluminosilicate minerals (the procedure is based on the Standard Sobek rather than the Modified Sobek method). This test was performed on a subset of eleven starter pit rock samples that showed moderate to elevated carbonate NP.

NP, Carbonate NP, and AP are all reported as kg equivalent calcium carbonate per tonne of rock.

Guidelines presented by INAC (1992), for northern mine sites, and by Price (1997) were applied in the classification of potentially acid generating (PAG) material for this study. The net potential ratio ($NPR = NP/AP$) is the principal indicator of ARD potential considered, as per the INAC guidelines summarized in Table 2-1.

Table 2-1
Acid Rock Drainage Screening Criteria (INAC, 1992)

Rock	Initial Screening Criteria	ARD Potential
	$NPR < 1$	Potentially Acid Generating (PAG)
	$1 < NPR < 2$	Uncertain
	$2 < NPR$	Acid Consuming Not Potentially Acid Generating (NPAG)

The net neutralization potential (NNP) was also evaluated for each sample ($NNP = NP - AP$). A negative NNP indicates a potential to generate acidic drainage whereas a positive NNP represents an ability to neutralize acid generated by the sample.

Finally, the relationship between paste pH and sulphide sulphur content was considered. Materials with a sulphide sulphur content of less than 0.3 wt.% and a paste pH greater than 5.5 may be classified as NPAG (Price, 1997) except where the rock matrix consists of base poor minerals (e.g., quartz), or where the sulphide minerals contain metals that may leach under weakly acidic to alkaline conditions. This criterion was considered as a screening tool rather than a definite indicator of the potential for acidification.

2.4 Shake Flask Extraction

Shake flask extraction (SFE) testing was used to determine the metal leaching potential of the rock and till samples, as per the method outlined in Price (1997). This involves a

twenty-four-hour leach extraction conducted on samples crushed to approximately minus 6.35 mm, using de-ionized water at a liquid to solid ratio of 3 to 1 (i.e., 750 ml distilled water to 250 g of sample). The resulting leachates were filtered and analyzed for pH, conductivity, alkalinity, acidity and sulphate, as well as low level metals by ICP MS.

Although drainage from the airstrip will not be discharged directly to any fresh water environment, metal concentrations in leachate generated by SFE tests were compared to the Canadian Council of Ministers of the Environment's (CCME) Canadian Environmental Quality Guidelines (CEQGs) for the protection of freshwater aquatic life (updated in 2002), and to the Canadian Metal Mining Effluent Regulations (MMER, 2002). Leach test results were measured against the CEQGs for comparative purposes only. These comparisons are considered to be initial screening tools in the identification of potential constituents of concern. Leach tests provide a good estimation of which metals have a *potential* to leach from a particular material. However, actual site drainage chemistry will almost certainly differ from SFE test results due to the inability of short-term leach tests to accurately simulate natural conditions. SFE testing results are therefore considered as *indicators* of potential constituents of concern, rather than accurate representations of future drainage compositions.

3.0 RESULTS

Analytical results corresponding to samples of the overburden (till) and rock from the previous airstrip alignment, as well as rock from the Third Portage starter pit, are presented in Tables 3-1 through 3-4 (attached). The chemical composition and ARD potential of the 6 samples identified to be within the starter pit benches from which airstrip construction materials will be excavated are statistically similar to the entire set of 59 samples from the starter pit. Thus, the results corresponding to all of the samples from the starter pit are presented in this report. The ARD and ML potential (as denoted by freshwater CEQG exceedances) of these samples, as well as the airstrip area overburden and rock samples, are summarized in Table 3-5.

Table 3-5
Summary of ARD Potential and Freshwater CEQG Exceedances in Airstrip Construction Materials

Material	ARD Potential	Freshwater CEQG Exceedances
Airstrip Overburden	NPAG	Al, Cu, Fe, F
Airstrip Rock	NPAG	Al, Cu, Hg
Starter Pit IV Rock	Variable (67% NPAG)	Al, As, Cd, Cu, Pb
Starter Pit IF Rock	PAG	Al, As, Cd, Cu, Fe, Hg, Ni, Zn
Starter Pit UM Rock	NPAG	As, Cu, Pb

The following subsections describe these results, by material type.

3.1 Airstrip Area Overburden (Till)

3.1.1 Chemical Composition

Whole rock and elemental analysis results of the airstrip area overburden samples are presented in Tables 3-1 and 3-2, respectively. The airstrip overburden samples consist of grey to brown, silty to sandy till, with 25% to 50% clasts of pebble to boulder size (Cowley, 2002). The trace metal contents of these samples are compared to those of the rock samples collected from the airstrip area, to provide a context for the magnitude of their trace metal levels.

Silicon and aluminum are the major components of all airstrip overburden samples. However, the average concentration of aluminum in these samples is slightly depleted as compared to the airstrip rock, along with some other major elements (calcium, magnesium, sodium, iron) and trace elements. The following observations are made with respect to individual trace metal concentrations:

The **arsenic** content is generally low in the airstrip overburden samples (less than 3.0 ppm). The median and average **chromium, copper, molybdenum** and **zinc** content of these samples is similar to that of the airstrip rock samples, while the median and average **cobalt, nickel, vanadium** content is generally lower. Median and average **lead** contents in the airstrip overburden samples are higher than in the airstrip rock samples (but lower than the starter pit IV). **Cadmium** and **silver** are below detectable limits in all airstrip overburden samples (<1 ppm).

3.1.2 ARD Potential

ABA results corresponding to the airstrip overburden samples are presented in Table 3-3. All of the airstrip overburden (till) samples are NPAG, based on the screening criteria shown in Table 2-1. These samples report alkaline paste pH values (8.6 to 9.3), and low sulphide sulphur contents (<0.01%). The NPR values of these samples range from greater than 45 to greater than 184. A comparison between carbonate NP¹ and bulk NP values for the airstrip overburden samples (Figure 3-1) suggests that the large majority of their neutralization potential can be attributed to the presence of reactive carbonate minerals.

¹ All AP and NP values are expressed in units of kg of CaCO₃ equivalent per tonne of rock.

3.1.3 ML Potential

The results of SFE tests conducted on airstrip overburden samples are presented in Table 3-4. Results are compared to mine site non-contact water quality (Golder, 2005) as well as to MMER and CEQG for freshwater aquatic life. Exceedances to these guidelines are summarized in Table 3-6.

Table 3-6
Summary of Airstrip Overburden Leachate Guideline Exceedances

Location	Sample ID	Exceedances	
		Freshwater CEQG	MMER
Airstrip	59545	Al, Cu, F	-
	59544	Al, Cu, Fe, F	-
	2015	Cu, F	-

Leachate pH values for all airstrip overburden samples are alkaline, ranging from 8.0 to 8.1. All samples also report CEQG exceedances of **aluminum**, **copper** and **fluoride**. **Iron** exceeds the CEQG in one airstrip overburden sample, while **nickel** and **arsenic** are below guidelines in all leachate samples. Arsenic concentrations are at or below 0.0006 mg/L in all samples, and nickel leachate concentrations range from below detectable limits (<0.0005 mg/L) to 0.0013 mg/L. All other CEQG-regulated constituents including **mercury**, **silver**, **selenium** and **thallium** are close to or below detection limits.

Aluminum, copper, iron and zinc also exceed CEQG in one sample of non-contact water at the Third Portage area, corroborating results of the SFE test. Fluoride and aluminum also occur naturally in Second and Third Portage lakes. Baseline water quality data of these lakes up to July 2002 show fluoride at 0.04 to 0.06 mg/L; and dissolved aluminum levels from below detectable limits (<0.005 mg/L) to 0.019 mg/L. Dissolved iron and copper are generally below detectable limits in these lakes (<0.01 and <0.001 mg/L, respectively) (Azimuth, 2005).

3.2 Airstrip Area Rock

3.2.1 Chemical Composition

All rock samples collected along the previous alignment of the airstrip consist of non-mineralized IV. Elemental compositions corresponding to these samples are presented in Table 3-2. Trace metal concentrations in the airstrip rock samples are similar in

magnitude to those found in the Third Portage starter pit IV rock samples, with the exception of **arsenic, nickel, lead** and **zinc**.

Arsenic concentrations in the airstrip rock samples are below the detection limit of 1 ppm, whereas the median concentration of arsenic in the starter pit IV samples is 7 ppm. **Lead** concentrations are also lower in the airstrip rock samples as compared to the starter pit IV samples, which have higher average and median concentrations of lead, but also a considerably larger standard deviation of results.

Nickel concentrations are generally higher in the airstrip rock samples, with a median concentration of 98 ppm as opposed to 68 ppm in the starter pit IV rock samples, although these latter samples show a higher standard deviation of results. The median **zinc** concentrations are similar for both the airstrip and starter pit IV rock samples (89 ppm compared to 96 ppm), although the latter samples again show a higher standard deviation of results. Mercury contents are consistently low for all samples (median concentrations of 10 ppb in airstrip rock samples).

3.2.2 ARD Potential

ABA results for the airstrip rock samples are presented in Table 3-3. None of the airstrip rock samples has the potential to generate ARD, as per the guidelines presented in Table 2-1. These samples report near-neutral to alkaline paste pH values, ranging from 7.3 to 9.3. The total sulphide sulphur content of all of these samples is below the detection limit (<0.01%). The NP values for all samples range from 42 to 94, with a median of 65, which is considerably higher than that of the starter pit IV samples (median NP of 8). NPR values range from greater than 133 to greater than 302. The carbonate NP values of the samples indicate that the majority of the NP is likely due to the presence of reactive carbonate minerals. The lower carbonate content of IV rock samples from the starter pit relative to airstrip rock samples likely reflects the silicification that is associated with the mineralization event.

3.2.3 ML Potential

Four of the ten airstrip rock samples were submitted for SFE testing, the results of which are presented in Table 3-4, as compared to both MMER and CEQG for freshwater aquatic life. Exceedances to these guidelines are summarized in Table 3-7.

Table 3-7
Summary of Airstrip Rock Leachate Guideline Exceedances

Location	Sample ID	Exceedances	
		Freshwater CEQG	MMER
Airstrip	AIR - 001	Al, Cu, Hg	-
	AIR - 005	Al	-
	AIR - 008	Al, Cu, Hg	-
	AIR - 010	Al, Cu	-

The SFE results from the airstrip rock samples are generally similar to those of the starter pit IV samples. The airstrip rock samples report leachate pH values range from 8.0 to 8.1, and CEQG exceedances of **aluminum** (all samples), **copper** (three samples), and **mercury** (two samples).

Similar to IV in the starter pit, airstrip rock sample leachate levels of **silver**, **iron**, **nickel** and **zinc** are mostly below their respective detection limits, and always below their respective CEQGs. Leachate **cadmium**, **chromium**, **lead**, **selenium** and **thallium** concentrations are all below their respective detection limits in the airstrip rock samples. All constituents in the airstrip rock sample leachates are compliant with MMER levels.

3.3 Starter Pit Rock

3.3.1 Chemical Composition

Tables 3-1 and 3-2 respectively present the results of the whole rock and elemental analyses, conducted on samples of IV and UM rock collected from the starter pit. Silicon and aluminum are the predominant elements in the starter pit IV rock samples, consistent with an abundance of quartz and aluminosilicate minerals. The starter pit UM rock samples report the highest median concentrations of magnesium and calcium out of all of the starter pit rock samples, which is consistent with their higher neutralization potential.

Arsenic is present in the starter pit IV and UM rock samples, although generally at low levels. The median concentration of arsenic in starter pit IV rock samples is 7 ppm, although concentrations for individual samples are variable (<1 ppm to 1989 ppm), resulting in a standard deviation that is many times larger than the median (434). Arsenic concentrations in the starter pit UM rock samples range from <1 ppm to 10 ppm, with a median concentration of 1 ppm. Arsenic is likely to be primarily associated with trace contents of arsenopyrite.

Copper is also generally present in low concentrations in the starter pit IV and UM rock samples. The median copper concentrations in these samples are 18 ppm and 28 ppm, respectively. Chalcopyrite is likely the main copper mineral, found in trace amounts in a limited number of pit rock samples on which mineralogical analysis was completed (Golder, 2003 and 2005).

The median **chromium** concentration in the starter pit UM rock samples is almost an order of magnitude higher than that of the starter pit IV rock samples (2200 ppm compared to 236 ppm). Similarly, **nickel** is significantly higher in the starter pit UM rock samples as compared to the starter pit IV rock samples, with a median concentration that is over an order of magnitude higher (1316 ppm compared to 68 ppm).

Lead and **zinc** concentrations are similar in the starter pit IV and UM rock samples. Median concentrations of lead in these samples are 24 ppm and 21 ppm, respectively, while median zinc concentrations are 96 ppm and 76 ppm.

Cadmium concentrations are below the laboratory detection limit of 1 ppm in all but one starter pit IV rock sample, and all but one starter pit UM rock sample. **Molybdenum** reports a median concentration of 4 ppm in the starter pit IV rock samples, and is below the laboratory detection limit of 2 ppm in all of the starter pit UM rock samples.

3.3.2 ARD Potential

ABA results corresponding to the starter pit rock samples of the three major lithologies (IF, IV, UM) are presented in Table 3-3. Most of the IF samples are PAG with measurable amounts of sulphide sulphur. IF rock from the starter pit must not be used for airstrip construction.

The starter pit IV rock samples have a variable potential to generate ARD. The majority of these samples (67%) are NPAG, but the remaining 33% have an uncertain to likely potential to generate ARD (NPR <2) according to the guidelines presented in Table 2-1. The starter pit IV rock samples report sulphide sulphur contents that range from <0.01% to 0.81%, and alkaline paste pH values that range from 7.7 to 10.0. NP values for these samples range from 4 to 37, and NPR values range from 0.2 to 25. Carbonate NP values are slightly lower than bulk NP values for all starter pit IV rock samples (Figure 3-1), suggesting that some proportion of the bulk NP is due to slower-reacting silicate minerals. Siderite NP values are generally similar to bulk NP values, suggesting that the presence of non-buffering metal carbonate minerals has little effect on NP determination for the samples tested.

All starter pit UM rock samples are NPAG, as per the guidelines presented in Table 2-1. Paste pH values for these samples are all alkaline, ranging from 9.1 to 9.5, and sulphide sulphur contents are low (median of 0.01%). The median NPR of these samples is 326, which is considerably higher than the NPR of any of the starter pit IV rock samples. Figure 3-1 shows that the ratio of Carbonate NP to bulk NP is close to unity, suggesting that the neutralization potential of these samples is provided by carbonate minerals.

3.3.3 ML Potential

Ten of the 24 starter pit IV and eight of the 16 starter pit UM rock samples were submitted for SFE tests. The results of these tests are presented in Table 3-4, as compared to both MMER and CEQG for freshwater aquatic life. Exceedances to these guidelines are summarized in Table 3-8.

Table 3-8
Summary of Starter Pit IV and UM Rock Leachate Guideline Exceedances

Location	Sample ID	Exceedances	
		Freshwater CEQG	MMER
Starter Pit IV	TP282-04	Al, Cu	-
	TP317-01	Al	-
	TP004-01	As, Cu	-
	TP030-01	As, Cu	-
	TP041-02	Al, Cu, Pb	-
	TP151-02	Al, Cu	-
	TP287-01	Al, Cu	-
	TP316-01	As, Cd, Cu	-
	TP464-01	As, Cu	-
	TP469-02	Al, Cu	-
Starter Pit UM	TP001-01	As, Cu	-
	TP001-02	Cu, Pb	-
	TP008-01	Cu	-
	TP041-01	Cu	-
	TP261-01	Cu	-
	TP373-01	Cu	-
	TP376-01	Cu	-
	TP377-01	Cu	-

Starter pit IV leachates report pH values that range from 6.7 to 8.3, and CEQG exceedances of **aluminum** (six samples), **arsenic** (four samples), **cadmium** (one sample), **copper** (nine samples), and **lead** (one sample). Leachate levels of **silver**, **chromium**, **iron**, **nickel**, **selenium**, and **thallium** in these samples are mostly below or close to their respective detection limits, and always below their respective CEQGs. All constituents in the starter pit IV leachates are compliant with MMER levels.

Starter pit UM leachates report pH values that range from 7.8 to 8.3, and CEQG exceedances of **arsenic** (one sample), **copper** (all samples), and **lead** (one sample). **Silver**, **cadmium**, **chromium**, **iron**, **mercury**, **selenium**, **thallium** and **zinc** are either close to or below their respective detection limits in all starter pit UM leachates. All constituents in these samples are compliant with MMER levels.

4.0 SUMMARY OF RESULTS

All samples of overburden (till) and rock from the airstrip have no potential to generate ARD, according to the screening criteria provided by INAC (1992). According to these same criteria, the starter pit UM samples also have no potential to generate ARD, and the starter pit IV samples show a variable ARD potential.

All of these materials report exceedances to the CEQG for freshwater aquatic life for a limited number of constituents. Guideline exceedances are noted in one or more samples for the following constituents: Al, Cu, Fe, and F in overburden samples; Al, Cu, and Hg in airstrip rock samples; Al, As, Cd, Cu, and Pb in starter pit IV rock; and As, Cu, and Pb in starter pit UM rock samples.

5.0 WORK TO BE COMPLETED

5.1 Rock Sampling

If rock from the crushed ore stockpile area is to be used in the airstrip construction, then at least three samples of this material should be collected during excavation for geochemical characterization. Rock samples collected less than 250 m away at the proposed plant site area, which were tested and described as part of the mine site material characterization program (Golder, 2003 and 2005), and were of the same rock type as that of the crushed ore stockpile area (IV), were all found to be NPAG. The plant site samples also showed CEQG exceedances of aluminum, arsenic, copper, and mercury.

As the starter pit UM rock samples have no potential to generate ARD, this rock type is preferable for use as airstrip construction fill. Should an insufficient amount of UM rock be available for this purpose, then starter pit IV rock can be used. In either case, confirmatory sampling and testing should be carried out on the starter pit rock used in the airstrip construction, to characterize the ARD potential of material that is actually used in the airstrip. Based on the quantity of rock required to complete the airstrip, a minimum of ten confirmatory samples should be collected during construction, although additional samples may be required if mineralization or a significant change in lithology are encountered. Should the bulk of the rock to be used in the airstrip construction be PAG (in the case that starter pit IV rock is used), a management strategy that incorporates the prevention of ARD onset, such as capping with a layer of UM rock or other acid-buffering material, could be necessary, depending on the results of the confirmatory testing.

All samples to be collected should encompass the spatial and compositional variability of the lithologies they represent, and should be a minimum of 2 kg in size. Samples can either be collected from excavated faces, pit walls, or from muck piles, and the location at which each sample is collected should be recorded. Each sample should be submitted for the following analyses: elemental solid phase chemistry, acid-base accounting (ABA), and shake flask extraction (SFE).

5.2 Water Sampling

Water that accumulates in the five settling ponds (as shown on Figure 1-1) is expected to infiltrate into the soil beneath them, as it has done thus far. Each of these ponds should be sampled and tested for water quality, during and after construction. Water samples should be collected whenever sufficient amounts of water accumulate in each settling pond, until freezing conditions occur. Samples should be analyzed for pH, hardness, conductivity, turbidity, total and speciated alkalinity, total suspended and dissolved solids (TSS and TDS), anions (chloride, fluoride, sulphate, nitrate, nitrite, and nitrate+nitrite), total organic nitrogen (including ammonia and total kjeldahl nitrogen, or TKN), and total and dissolved metals by ICP-MS, including mercury. Depending on the water quality of the samples collected from the airstrip settling ponds, the frequency of sampling may be adjusted. If the water quality of these samples is consistently found to be acceptable with respect to applicable regulatory guidelines over a significant period of time, sampling may be carried out less frequently, or discontinued, pending review of the analytical results.

We trust this meets your requirements at this time. If you have any questions, comments or recommendations regarding this report, please contact the undersigned.

Yours very truly,

GOLDER ASSOCIATES LTD.

Preeti Anand, B.Sc.
Scientist, Mining Group

John Hull, P.Eng.
Principal

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Table 3-1
Whole Rock Analysis Results
Meadowbank Project
Cumberland Resources Ltd.

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		SiO2 (%)	Al2O3 (%)	Fe2O3 (%)	CaO (%)	MgO (%)	Na2O (%)	K2O (%)	TiO2 (%)	MnO (%)	P2O5 (%)	Ba (ppm)	Sr (ppm)	Zr (ppm)	Y (ppm)	Sc (ppm)	LOI ¹ (%)	Total (%)
				from	to	from	to																	
Airstrip - Overburden	Till	59545	-	0	1.1	-	-	67.82	13.18	3.73	2.44	2.00	3.20	3.40	0.34	0.06	0.11	700	270	130	15	5	3.16	99.55
Airstrip - Overburden	Till	59544	-	0	1.4	-	-	69.43	13.42	3.17	1.93	1.64	3.36	3.78	0.31	0.05	0.12	760	300	140	15	5	2.17	99.50
Airstrip - Overburden	Till	2015	-	1.2	2.7	-	-	64.20	13.90	4.25	3.33	2.50	4.13	2.15	0.45	0.07	0.16	510	420	130	10	10	4.22	99.46
<i>min</i> <i>max</i> <i>average</i> <i>median</i> <i>standard deviation</i>								64.20	13.18	3.17	1.93	1.64	3.20	2.15	0.31	0.05	0.11	510	270	130	10	5	2.17	99.46
								69.43	13.90	4.25	3.33	2.50	4.13	3.78	0.45	0.07	0.16	760	420	140	15	10	4.22	99.55
								67.15	13.50	3.72	2.57	2.05	3.56	3.11	0.37	0.06	0.13	657	330	133	13	7	3.18	99.50
								67.82	13.42	3.73	2.44	2.00	3.36	3.40	0.34	0.06	0.12	700	300	130	15	5	3.16	99.50
								2.68	0.37	0.54	0.71	0.43	0.50	0.85	0.07	0.01	0.03	131	79	6	3	3	1.03	0.05
Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		SiO2 (%)	Al2O3 (%)	Fe2O3 (%)	CaO (%)	MgO (%)	Na2O (%)	K2O (%)	TiO2 (%)	MnO (%)	P2O5 (%)	Ba (ppm)	Sr (ppm)	Zr (ppm)	Y (ppm)	Sc (ppm)	LOI ¹ (%)	Total (%)
Starter Pit Rock	IV	TP205-01 [#]	(3P2) 2+20N	4	7	139	136	63.71	15.77	9.54	0.30	2.25	0.49	3.93	0.49	0.04	0.18	1747	161	119	8	7	2.65	99.55
Starter Pit Rock	IV	TP282-02	3+25N	13	16	129	126	63.87	17.73	7.91	0.56	0.88	0.17	4.58	0.67	0.04	0.44	1380	340	200	10	10	2.45	99.48
Starter Pit Rock	IV	TP042-01	0+80S	17	21	129	125	71.49	14.60	4.60	0.19	0.78	0.15	4.56	0.36	0.04	0.16	635	239	107	<5	6	2.70	99.71
Starter Pit Rock	IV	TP091-01	(3P2) 3+40N	11	14	128	125	67.02	16.42	7.00	0.20	1.28	0.16	4.29	0.45	0.06	0.17	1042	87	113	7	6	2.53	99.70
Starter Pit Rock	IV	TP316-01	3+00N	17	21	128	124	59.05	15.34	11.31	0.32	3.98	0.08	4.70	0.72	0.11	0.16	722	58	133	17	21	3.39	99.26
Starter Pit Rock	IV	TP469-01	(3P2) 2+60N	26	30	128	124	58.84	11.96	19.76	0.50	2.59	0.11	2.06	0.46	0.12	0.28	262	119	112	11	13	3.07	99.79
Starter Pit Rock	IV	TP005-02	(3P2) 2+60N	22	25	126	123	70.93	15.26	3.67	0.11	0.61	2.31	4.08	0.41	0.01	0.08	682	138	128	7	6	2.16	99.73
Starter Pit Rock	IV	TP030-01	3+00N	8	12	126	122	67.92	16.51	5.12	0.19	1.16	0.10	4.94	0.46	0.05	0.15	761	152	138	7	6	2.99	99.70
Starter Pit Rock	IV	TP085-01	1+20S	27	30	123	120	65.60	17.93	6.77	0.20	1.00	0.20	4.69	0.50	0.04	0.14	528	273	104	8	8	2.64	99.81
Starter Pit Rock	IV	TP464-01	0+95N	15	20	125	120	68.26	15.27	6.25	0.28	1.05	0.13	4.20	0.43	0.05	0.21	907	194	139	7	7	3.16	99.41
Starter Pit Rock	IV	TP317-01	3+25N	25	29	122	118	61.04	15.59	7.46	3.58	3.27	0.25	4.52	0.69	0.10	0.15	560	650	130	15	15	3.01	99.79
Starter Pit Rock	IV	TP151-02	(3P2) 3+40N	38	42	118	114	61.13	15.94	6.80	3.67	3.82	0.41	4.52	0.65	0.10	0.14	656	233	97	14	19	2.34	99.62
Starter Pit Rock	IV	TP314-01	2+63N	31	35	117	113	61.14	14.85	7.63	2.94	3.62	0.29	4.46	0.71	0.12	0.12	556	229	142	16	20	3.48	99.45
Starter Pit Rock	IV	TP004-01	(3P2) 3+00N	30	34	114	111	70.00	16.07	4.25	0.14	0.80	0.13	5.23	0.47	0.03	0.12	759	159	124	8	5	2.47	99.82
Starter Pit Rock	IV	TP204-01	1+20S	37	41	115	111	57.25	17.44	9.36	2.68	3.89	2.40	3.23	0.72	0.10	0.16	721	326	94	18	24	2.37	99.71
Starter Pit Rock	IV	TP469-02	(3P2) 2+60N	48	52	112	108	61.30	15.52	8.72	2.52	3.42	2.15	3.14	0.66	0.09	0.16	600	233	109	14	22	2.03	99.80
Starter Pit Rock	IV	TP282-04	3+25N	37	40	110	107	62.72	14.54	7.72	2.97	3.58	1.13	3.70	0.67	0.10	0.14	570	320	130	15	20	2.19	99.57
Starter Pit Rock	IV	TP370-02	(3P2) 1+00N	31	35	112	107	68.58	18.40	2.98	0.15	0.69	0.22	5.69	0.50	0.02	0.10	963	200	97	7	6	2.33	99.79
Starter Pit Rock	IV	TP041-02	0+40S	61	65	97	93	64.79	14.70	5.61	3.17	2.77	2.77	3.43	0.53	0.07	0.12	596	415	107	12	15	1.54	99.63
Starter Pit Rock	IV	TP287-01	1+80N	48	52	97	93	60.09	15.44	10.45	1.70	3.43	0.22	4.63	0.70	0.09	0.13	711	195	135	17	21	2.40	99.39
Starter Pit Rock	IV	TP291-01	(3P2) 1+80N	75	79	91	88	62.66	15.67	6.49	2.11	3.68	0.61	4.79	0.57	0.10	0.13	840	360	130	15	15	2.59	99.51
Starter Pit Rock	IV	TP379-02	(3P2) 1+80N	62	65	91	88	53.38	9.79	26.05	0.08	5.05	0.39	0.15	0.48	0.22	0.10	42	49	22	11	39	3.30	98.99
Starter Pit Rock	IV	TP026-02	0+80S	76	80	90	86	59.84	15.93	8.04	3.12	3.88	2.36	2.60	0.61	0.10	0.14	652	393	120	14	20	2.77	99.52
Starter Pit Rock	IV	TP205-03	(3P2) 2+20N	108	110	70	68	63.19	15.39	6.59	2.71	3.23	3.42	2.33	0.57	0.08	0.13	472	340	107	16	17	1.76	99.50
<i>min</i> <i>max</i> <i>average</i> <i>median</i> <i>standard deviation</i>								53.38	9.79	2.98	0.08	0.61	0.08	0.15	0.36	0.01	0.08	42	49	22	<5	5	1.54	98.99
								71.49	18.40	26.05	3.67	5.05	3.42	5.69	0.72	0.22	0.44	1747	650	200	18	39	3.48	99.82
								63.49	15.50	8.34	1.43	2.53	0.86	3.94	0.56	0.08	0.16	724	244	118	12	15	2.60	99.59
								62.96	15.56	7.23	0.53	3.00	0.27	4.38	0.55	0.09	0.14	669	231	120	12	15	2.56	99.63
								4.57	1.79	5.02	1.38	1.38	1.05	1.21	0.11	0.04	0.07	336	134	30	4	8	0.49	0.20

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

<i>min</i>	44.07	7.24	3.17	0.09	0.75	0.08	0.31	0.08	0.02	0.04	0.01	0.01	20	5	<5	1.08	98.66
<i>max</i>	74.13	18.39	24.16	9.39	15.78	7.15	5.61	1.01	0.21	0.64	1900	860	180	20	30	11.63	99.85
<i>average</i>	62.01	15.21	8.05	2.01	3.40	0.92	3.73	0.55	0.07	0.17	535	248	120	13	13	3.22	99.43
<i>median</i>	63.14	15.39	7.57	0.93	3.35	0.32	4.02	0.57	0.06	0.14	550	180	120	15	15	2.60	99.51
<i>standard deviation</i>	6.80	1.75	3.42	2.13	2.86	1.24	1.33	0.18	0.05	0.12	403	248	33	5	7	2.09	0.30

Table 3-1
Whole Rock Analysis Results
Meadowbank Project
Cumberland Resources Ltd.

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		SiO2 (%)	Al2O3 (%)	Fe2O3 (%)	CaO (%)	MgO (%)	Na2O (%)	K2O (%)	TiO2 (%)	MnO (%)	P2O5 (%)	Ba (ppm)	Sr (ppm)	Zr (ppm)	Y (ppm)	Sc (ppm)	LOI ¹ (%)	Total (%)
				from	to	from	to																	
Starter Pit Rock	IF	TP285-01 [#]	3+00N	4	7	138	135	57.56	3.11	34.21	0.49	2.01	<0.01	<0.01	0.10	0.16	0.32	11	40	37	8	5	1.44	99.41
Starter Pit Rock	IF	TP282-01 [#]	3+25N	8	11	135	132	47.98	2.27	45.42	0.71	2.13	<0.01	0.01	0.07	0.22	0.49	10	50	30	5	5	0.38	99.70
Starter Pit Rock	IF	TP371-01 [#]	(3P2) 1+40N	7	10	134	131	50.77	0.36	46.81	0.44	1.57	<0.01	0.01	0.01	0.10	0.38	15	49	28	7	8	<0.01	99.70
Starter Pit Rock	IF	TP283-01 [#]	3+00N	8	11	133	130	53.58	0.48	42.81	0.52	1.67	<0.01	<0.01	0.01	0.17	0.37	12	33	25	6	<5	<0.01	99.36
Starter Pit Rock	IF	TP382-01	2+63N	8	11	131	128	68.02	2.96	25.58	0.41	0.84	<0.01	0.29	0.05	0.04	0.26	79	47	31	7	<5	0.87	99.36
Starter Pit Rock	IF	TP032-01	3+25N	5	9	131	127	54.55	0.81	42.04	0.74	0.91	0.02	0.07	0.02	0.09	0.39	104	68	28	8	<5	<0.01	99.62
Starter Pit Rock	IF	TP374-01	(3P2) 1+00N	25	29	121	126	43.17	0.17	55.56	0.34	1.21	<0.01	<0.01	<0.01	0.06	0.17	21	51	29	<5	<5	<0.01	99.62
Starter Pit Rock	IF	TP092-01	(3P2) 3+40N	10	13	126	123	54.75	1.89	39.21	0.34	2.01	<0.01	0.08	0.04	0.10	0.29	14	27	30	9	<5	1.04	99.76
Starter Pit Rock	IF	TP151-01	(3P2) 3+40N	29	32	125	122	50.43	4.81	38.78	0.58	1.95	0.05	0.77	0.18	0.11	0.43	176	107	60	6	6	1.45	99.57
Starter Pit Rock	IF	TP194-01	(3P2) 1+00N	18	22	122	118	60.04	0.28	37.32	0.45	0.85	<0.01	0.01	<0.01	0.07	0.32	15	37	23	6	<5	<0.01	99.34
Starter Pit Rock	IF	TP282-03	3+25N	24	28	122	118	51.13	2.43	42.15	0.25	1.64	0.01	0.11	0.06	0.14	0.24	40	50	30	5	<5	1.30	99.47
Starter Pit Rock	IF	TP286-01	1+80N	29	33	122	118	47.66	0.27	48.87	0.57	1.69	<0.01	0.02	<0.01	0.10	0.41	13	74	28	<5	<5	<0.01	99.58
Starter Pit Rock	IF	TP370-01	(3P2) 1+00N	20	24	122	118	48.00	0.34	47.55	0.77	2.35	<0.01	0.05	<0.01	0.14	0.19	16	47	25	7	9	0.20	99.60
Starter Pit Rock	IF	TP042-02	0+80S	30	34	120	116	40.04	0.68	56.03	0.50	2.65	<0.01	0.02	0.02	0.27	0.20	24	38	39	12	50	<0.01	99.69
Starter Pit Rock	IF	TP371-02	(3P2) 1+40N	26	30	117	113	61.38	1.04	34.12	0.22	1.77	<0.01	0.04	0.03	0.14	0.20	14	30	26	12	<5	0.37	99.31
Starter Pit Rock	IF	TP023-01	3+25N	35	39	110	106	57.49	4.21	48.44	0.35	2.28	0.01	0.08	0.14	0.13	0.25	20	<10	50	10	5	0.63 *	114.01
Starter Pit Rock	IF	TP291-02	(3P2) 1+80N	55	60	105	102	51.37	5.36	36.36	0.74	3.04	<0.01	0.68	0.18	0.08	0.28	80	230	80	10	5	1.50	99.64
Starter Pit Rock	IF	TP379-01	(3P2) 1+80N	10	13	105	102	46.54	0.59	50.43	0.26	1.19	<0.01	<0.01	0.02	0.06	0.27	19	36	28	5	<5	0.11	99.49
Starter Pit Rock	IF	TP205-02	(3P2) 2+20N	92	95	80	77	52.88	0.85	41.49	1.62	1.62	<0.01	0.04	0.03	0.11	0.37	11	51	27	6	<5	0.48	99.49
min								40.04	0.17	25.58	0.22	0.84	<0.01	<0.01	<0.01	0.04	0.17	10	<10	23	<5	<5	<0.01	99.31
max								68.02	5.36	56.03	1.62	3.04	0.05	0.77	0.18	0.27	0.49	176	230	80	12	50	1.50	114.01
average								52.49	1.73	42.80	0.54	1.76	<0.01	0.12	0.05	0.12	0.31	37	56	34	7	6	0.52	100.30
median								51.37	0.85	42.15	0.49	1.69	<0.01	0.04	0.03	0.11	0.29	16	47	29	7	<5	0.37	99.58
standard deviation								6.62	1.66	7.67	0.31	0.60	0.01	0.22	0.06	0.06	0.09	44	47	14	3	11	0.57	3.32

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

min	37.41	<0.01	9.20	0.01	0.51	<0.01	<0.01	0.01	0.03	0.01	0.01	0.01	20	<5	<5	<0.01	93.32
max	74.74	11.92	54.39	6.86	24.41	0.09	0.66	0.59	0.34	0.37	120	500	60	10	20	15.15	110.68
average	51.47	2.29	40.23	0.95	3.18	0.02	0.12	0.08	0.13	0.21	31	100	33	5	<5	1.59	99.98
median	50.09	1.26	43.53	0.51	1.82	<0.01	0.09	0.04	0.12	0.23	20	30	30	5	<5	0.62	99.59
standard deviation	8.09	2.56	12.11	1.60	4.74	0.02	0.13	0.12	0.09	0.10	29	128	10	2	4	3.25	3.55

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		SiO2 (%)	Al2O3 (%)	Fe2O3 (%)	CaO (%)	MgO (%)	Na2O (%)	K2O (%)	TiO2 (%)	MnO (%)	P2O5 (%)	Ba (ppm)	Sr (ppm)	Zr (ppm)	Y (ppm)	Sc (ppm)	LOI ¹ (%)	Total (%)
				from	to	from	to																	
Starter Pit Rock	UM	TP005-01 [#]	(3P2) 2+60N	13	16	133	130	39.79	6.83	10.35	5.39	25.01	0.02	<0.01	0.34	0.12	0.04	40	101	<10	7	25	11.42	99.33
Starter Pit Rock	UM	TP001-01	(3P2) 2+20N	16	20	131	127	37.86	7.23	10.76	5.36	24.83	0.03	0.02	0.36	0.16	0.05	41	140	<10	11	27	12.52	99.19
Starter Pit Rock	UM	TP008-01	(3P2) 3+00N	13	17	127	124	40.48	7.06	10.54	2.96	27.46	0.01	<0.01	0.34	0.10	0.04	45	94	<10	8	25	10.36	99.37
Starter Pit Rock	UM	TP041-01	0+40S	19	23	121	117	41.37	9.72	13.92	5.08	17.90	0.08	1.83	0.48	0.17	0.04	187	42	<10	8	28	8.73	99.35
Starter Pit Rock	UM	TP026-01	0+80S	35	39	118	114	40.61	7.97	11.38	3.68	25.03	0.02	<0.01	0.40	0.14	0.05	44	71	<10	7	29	10.21	99.49
Starter Pit Rock	UM	TP373-01	(3P2) 1+00N	26	30	117	113	40.58	7.50	10.89	2.82	26.42	0.01	<0.01	0.35	0.12	0.03	43	70	<10	10	27	10.43	99.18
Starter Pit Rock	UM	TP377-01	(3P2) 1+40N	26	30	117	112	41.70	8.54	14.68	6.18	18.06	0.07	1.07	0.39	0.22	0.04	169	40	<10	10	34	8.12	99.10
Starter Pit Rock	UM	TP001-02	(3P2) 2+20N	37	41	115	111	35.46	5.41	9.35	7.18	25.49	0.02	0.01	0.26	0.18	0.03	44	252	<10	6	20	15.61	99.03
Starter Pit Rock	UM	TP462-01	1+50N	25	30	114	109	40.24	7.80	11.03	7.83	20.93	0.14	0.95	0.40	0.17	0.06	167	105	<10	8	28	9.87	99.42
Starter Pit Rock	UM	TP085-02	1+20S	52	55	106	103	38.20	5.69	9.68	5.95	25.27	0.01	<0.01	0.30	0.18	0.04	39	157	<10	6	21	14.10	99.44
Starter Pit Rock	UM	TP261-01	1+80N	34	38	107	103	38.07	6.59	10.70	5.66	24.16	0.01	<0.01	0.33	0.17	0.05	39	68	<10	7	25	13.34	99.10
Starter Pit Rock	UM	TP371-03	(3P2) 1+40N	43	47	102	98	38.79	7.15	10.59	4.70	25.29	0.01	<0.01	0.35	0.14	0.04	43	150	<10	6	25	12.22	99.31
Starter Pit Rock	UM	TP376-01	(3P2) 1+40N	56	60	102	98	38.18	6.57	10.23	5.28	25.19	0.01	<0.01	0.34	0.15	0.04	42	172	<10	8	24	13.16	99.17
Starter Pit Rock	UM	TP464-02	0+95N	40	45	101	96	36.22	6.02	9.89	8.32	23.62	0.04	0.08	0.29	0.20	0.05	54	183	<10	5	22	14.68	99.42
Starter Pit Rock	UM	TP380-01	(3P2) 1+80N	45	49	100	95	43.66	9.42	16.05	4.63	16.61	0.08	1.18	0.44	0.23	0.05	210	60	30	10	40	6.82	99.21
Starter Pit Rock	UM	TP370-03	(3P2) 1+00N	55	59	90	86	42.42	6.12	10.03	4.10	25.10	0.02	0.02	0.31	0.13	0.04	41	111	<10	6	22	10.94	99.23
min max average median standard deviation								35.46	5.41	9.35	2.82	16.61	0.01	<0.01	0.26	0.10	0.03	39	40	<10	5	20	6.82	99.03
								43.66	9.72	16.05	8.32	27.46	0.14	1.83	0.48	0.23	0.06	210	252	30	11	40	15.61	99.49
								39.60	7.23	11.25	5.32	23.52	0.04	0.33	0.36	0.16	0.04	78	114	<10	8	26	11.41	99.27
								40.02	7.11	10.65	5.32	25.02	0.02	<0.01	0.35	0.17	0.04	44	103	<10	8	25	11.18	99.27
								2.22	1.24	1.91	1.57	3.28	0.04	0.58	0.06	0.04	0.01	63	58	n/a	2	5	2.44	0.14

Table 3-2
Elemental Analysis Results
Meadowbank Project
Cumberland Resources Ltd.

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	Mg	Mn	Mo	Na	Ni	P	Pb	Sb	Se	Sr	Ti	U	V	W	Zn
				from	to	from	to	(ppm)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(%)	(ppb)	(%)	(%)	(ppm)	(ppm)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Airstrip - Overburden	Till	59545	-	0	1.1	-	-	<1	6.56	1	780	1.5	<5	1.66	<1	9	205	24	2.74	-	2.97	1.21	425	6	2.10	41	530	18	-	-	290	0.12	-	46	<10	74
Airstrip - Overburden	Till	59544	-	0	1.4	-	-	<1	6.39	1	820	1.5	<5	1.25	<1	8	141	21	2.28	-	3.10	0.95	345	2	2.06	33	540	20	-	-	308	0.12	-	38	10	66
Airstrip - Overburden	Till	2015	-	1.2	2.7	-	-	<1	6.59	3	540	1.0	<5	2.20	<1	9	165	28	2.99	-	1.93	1.43	445	2	2.61	53	760	10	-	-	418	0.09	-	60	10	80
<i>min</i> <i>max</i> <i>average</i> <i>median</i> <i>standard deviation</i>								<1	6.39	1	540	1.0	<5	1.25	<1	8	141	21	2.28	-	1.93	0.95	345	2	2.06	33	530	10	-	-	290	0.09	-	38	<10	66
								<1	6.59	3	820	1.5	<5	2.20	<1	9	205	28	2.99	-	3.10	1.43	445	6	2.61	53	760	20	-	-	418	0.12	-	60	10	80
								<1	6.51	2	713	1.3	<5	1.70	<1	9	170	24	2.67	-	2.67	1.20	405	3	2.26	42	610	16	-	-	339	0.11	-	48	8	73
								<1	6.56	1	780	1.5	<5	1.66	<1	9	165	24	2.74	-	2.97	1.21	425	2	2.10	41	540	18	-	-	308	0.12	-	46	10	74
								<i>n/a</i>	0.11	1	151	0.3	<i>n/a</i>	0.48	<i>n/a</i>	1	32	4	0.36	-	0.64	0.24	53	2	0.31	10	130	5	-	-	69	0.02	-	11	3	7

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	Mg	Mn	Mo	Na	Ni	P	Pb	Sb	Se	Sr	Ti	U	V	W	Zn
				from	to	from	to	(ppm)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(%)	(ppb)	(%)	(%)	(ppm)	(ppm)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Airstrip - Rock	IV	AIR - 001	-	Surface	-	-	-	1	7.42	<1	210	0.5	<5	2.25	<1	16	145	12	3.34	<5	0.59	2.19	510	<2	4.01	98	770	<2	-	0.1	448	0.07	<1	77	<10	108
Airstrip - Rock	IV	AIR - 002	-	Surface	-	-	-	<1	7.35	<1	380	1.0	<5	2.42	<1	15	170	4	3.44	15	1.08	2.31	485	2	3.26	92	1180	10	-	0.2	445	0.07	<1	96	<10	88
Airstrip - Rock	IV	AIR - 003	-	Surface	-	-	-	<1	8.38	<1	450	0.5	<5	2.51	<1	13	154	11	3.14	10	1.35	1.82	470	2	3.66	85	700	6	-	0.1	511	0.07	<1	72	<10	80
Airstrip - Rock	IV	AIR - 004	-	Surface	-	-	-	2	7.02	<1	590	0.5	<5	3.74	<1	17	163	17	3.44	5	1.94	2.26	590	<2	2.36	108	1100	4	-	0.1	479	0.11	<1	92	<10	114
Airstrip - Rock	IV	AIR - 005	-	Surface	-	-	-	<1	7.85	<1	480	<0.5	<5	3.23	<1	16	132	2	2.87	<5	1.19	1.78	615	<2	3.96	65	780	4	-	0.1	572	0.29	<1	70	<10	82
Airstrip - Rock	IV	AIR - 006	-	Surface	-	-	-	<1	7.58	<1	540	0.5	<5	2.59	<1	16	149	16	3.22	5	1.47	1.78	475	2	3.36	88	900	4	-	0.1	477	0.10	<1	89	<10	90
Airstrip - Rock	IV	AIR - 007	-	Surface	-	-	-	2	7.73	<1	630	0.5	<5	3.55	<1	18	212	14	3.77	10	2.01	2.71	660	6	2.35	118	1170	18	-	0.2	487	0.14	<1	100	<10	112
Airstrip - Rock	IV	AIR - 008	-	Surface	-	-	-	<1	7.83	<1	510	0.5	<5	2.36	<1	22	175	16	4.25	5	1.57	2.33	630	4	3.31	98	980	12	-	0.2	586	0.18	<1	105	<10	78
Airstrip - Rock	IV	AIR - 009	-	Surface	-	-	-	2	7.81	<1	360	0.5	<5	2.95	<1	21	115	21	4.57	15	1.27	2.49	720	<2	3.37	89	780	8	-	0.2	611	0.14	<1	111	<10	82
Airstrip - Rock	IV	AIR - 010	-	Surface	-	-	-	<1	11.07	<1	500	0.5	<5	1.77	<1	16	165	13	3.35	10	1.78	2.39	495	2	3.49	82	790	<2	-	0.1	472	0.15	<1	79	<10	98
<i>min</i> <i>max</i> <i>average</i> <i>median</i> <i>standard deviation</i>								<1	7.02	<1	210	<0.5	<5	1.77	<1	13	115	2	2.87	<5	0.59	1.78	470	<2	2.35	65	700	<2	-	0.1	445	0.07	<1	70	<10	78
								2	11.07	<1	630	1.0	<5	3.74	<1	22	212	21	4.57	15	2.01	2.71	720	6	4.01	118	1180	18	-	0.2	611	0.29	<1	111	<10	114
								1	8.00	<1	465	0.5	<5	2.74	<1	17	158	13	3.54	9	1.43	2.21	565	2	3.31	92	915	7	-	0.1	509	0.13	<1	89	<10	93
								<1	7.77	<1	490	0.5	<5	2.55	<1	16	159	14	3.40	10	1.41	2.29	550	2	3.37	91	845	5	-	0.1	483	0.13	<1	91	<10	89
								1	1.14	<i>n/a</i>	123	0.2	<i>n/a</i>	0.62	<i>n/a</i>	3	26	6	0.52	4	0.43	0.32	89	2	0.57	15	181	5	-	0.1	60	0.07	<i>n/a</i>	14	<i>n/a</i>	14

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		Ag (ppm)	Al (%)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Ca (%)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)	Fe (%)	Hg (ppb)	K (%)	Mg (%)	Mn (ppm)	Mo (ppm)	Na (%)	Ni (ppm)	P (ppm)	Pb (ppm)	Sb (ppm)	Se (ppm)	Sr (ppm)	Ti (%)	U (ppm)	V (ppm)	W (ppm)	Zn (ppm)
				from	to	from	to																													
Starter Pit Rock	IV	TP205-01 [#]	(3P2) 2+20N	4	7	139	136	<1	8.63	<1	1809	4.0	<5	0.27	<1	10	104	<1	6.95	5	3.33	1.38	364	3	0.70	59	734	31	2	0.1	154	0.23	<1	70	<10	134
Starter Pit Rock	IV	TP282-02	3+25N	13	16	129	126	<1	7.92	900	1390	1.0	<5	0.36	<1	13	76	2	5.35	-	3.97	0.49	245	<2	0.10	30	1830	10	-	-	282	0.25	-	74	10	58
Starter Pit Rock	IV	TP042-01	0+80S	17	21	129	125	<1	7.95	73	668	0.6	<5	0.16	<1	12	108	18	3.21	5	3.54	0.48	300	5	0.31	34	572	23	2	0.1	224	0.17	<1	48	<10	56
Starter Pit Rock	IV	TP091-01	(3P2) 3+40N	11	14	128	125	<1	9.35	14	1167	2.1	<5	0.21	<1	9	97	<1	5.98	5	4.14	0.83	529	11	0.58	34	718	25	<1	0.1	89	0.24	<1	63	<10	88
Starter Pit Rock	IV	TP316-01	3+00N	17	21	128	124	1	8.86	11	796	1.8	<5	0.30	47	31	353	18	8.44	10	4.06	2.57	968	12	0.47	101	661	1624	3	0.8	57	0.22	<1	155	30	3210
Starter Pit Rock	IV	TP469-01	(3P2) 2+60N	26	30	128	124	<1	7.07	<1	301	<0.5	<5	0.41	<1	19	219	<1	14.95	5	1.86	1.72	1027	<2	0.30	66	1148	23	3	0.1	117	0.27	<1	113	<10	238
Starter Pit Rock	IV	TP005-02	(3P2) 2+60N	22	25	126	123	<1	7.48	<1	647	0.8	<5	0.09	<1	10	88	14	2.42	20	2.88	0.32	87	5	1.59	39	288	18	1	0.2	109	0.15	<1	55	<10	23
Starter Pit Rock	IV	TP030-01	3+00N	8	12	126	122	<1	8.68	46	758	0.9	<5	0.15	<1	11	73	13	3.61	5	3.77	0.68	388	4	0.24	19	527	12	2	0.1	138	0.20	<1	52	<10	88
Starter Pit Rock	IV	TP085-01	1+20S	27	30	123	120	<1	9.33	53	567	1.2	<5	0.19	<1	14	80	<1	5.13	15	4.11	0.60	354	5	0.55	42	628	21	2	0.1	209	0.21	<1	64	<10	71
Starter Pit Rock	IV	TP464-01	0+95N	15	20	125	120	<1	8.82	62	1011	0.5	<5	0.22	<1	14	53	11	4.84	15	3.59	0.67	455	4	0.33	43	821	20	2	0.1	194	0.21	<1	53	<10	71
Starter Pit Rock	IV	TP317-01	3+25N	25	29	122	118	<1	9.26	10	680	<0.5	<5	2.89	<1	28	282	23	5.79	-	3.80	2.12	850	6	0.75	91	610	24	-	-	243	0.40	-	161	<10	74
Starter Pit Rock	IV	TP151-02	(3P2) 3+40N	38	42	118	114	<1	8.99	<1	686	<0.5	<5	2.80	<1	27	320	67	5.08	5	3.98	2.35	805	7	0.76	89	510	23	6	0.5	237	0.36	<1	139	<10	138
Starter Pit Rock	IV	TP314-01	2+63N	31	35	117	113	<1	8.44	<1	590	<0.5	<5	2.26	<1	35	402	40	5.68	5	3.92	2.25	953	5	0.63	102	537	48	4	0.4	229	0.39	<1	157	<10	307
Starter Pit Rock	IV	TP004-01	(3P2) 3+00N	30	34	114	111	<1	9.17	58	828	0.5	<5	0.12	<1	11	93	3	3.11	20	4.36	0.51	234	6	0.26	31	453	9	1	0.2	165	0.26	<1	54	<10	47
Starter Pit Rock	IV	TP204-01	1+20S	37	41	115	111	<1	9.11	<1	688	<0.5	<5	1.98	<1	35	293	52	6.69	10	2.61	2.30	778	4	1.92	116	611	31	4	0.4	318	0.37	<1	164	<10	109
Starter Pit Rock	IV	TP469-02	(3P2) 2+60N	48	52	112	108	<1	8.64	21	638	<0.5	<5	1.83	<1	33	245	52	6.36	5	2.61	2.13	764	4	1.80	115	591	34	2	0.5	223	0.39	<1	158	<10	145
Starter Pit Rock	IV	TP282-04	3+25N	37	40	110	107	<1	6.61	1	560	1.0	<5	1.86	<1	21	369	40	5.27	-	3.05	2.00	590	2	0.69	70	560	20	-	-	305	0.31	-	128	<10	78
Starter Pit Rock	IV	TP370-02	(3P2) 1+00N	31	35	112	107	<1	9.44	56	993	1.5	<5	0.15	<1	12	85	4	2.12	5	4.45	0.42	197	5	0.51	18	454	31	1	0.1	184	0.23	<1	58	<10	58
Starter Pit Rock	IV	TP041-02	0+40S	61	65	97	93	1	8.43	<1	635	<0.5	<5	2.35	<1	25	250	44	4.24	10	2.87	1.75	624	4	2.22	76	479	30	4	0.3	438	0.31	<1	112	<10	103
Starter Pit Rock	IV	TP287-01	1+80N	48	52	97	93	<1	8.89	<1	777	1.0	<5	0.96	<1	41	374	91	8.01	5	4.13	2.17	782	4	0.56	109	544	43	2	0.9	174	0.41	<1	162	<10	156
Starter Pit Rock	IV	TP291-01	(3P2) 1+80N	75	79	91	88	<1	6.70	4	770	1.0	<5	1.29	<1	18	226	23	4.32	-	3.53	1.99	640	4	0.42	61	490	46	-	-	325	0.30	-	101	10	106
Starter Pit Rock	IV	TP379-02	(3P2) 1+80N	62	65	91	88	<1	5.33	1989	54	<0.5	<5	0.09	<1	172	3523	<1	>15.00	30	0.26	3.01	1739	<2	0.59	2579	330	19	32	0.1	34	0.25	14	197	<10	127
Starter Pit Rock	IV	TP026-02	0+80S	76	80	90	86	<1	8.60	<1	664	<0.5	<5	2.22	<1	31	318	35	5.75	10	2.11	2.33	805	4	1.84	88	514	21	2	0.3	397	0.33	<1	137	<10	105
Starter Pit Rock	IV	TP205-03	(3P2) 2+20N	108	110	70	68	<1	8.80	<1	508	<0.5	<5	2.12	<1	26	279	63	5.01	5	2.10	2.03	675	6	2.92	86	481	33	2	0.6	363	0.32	<1	117	<10	64
		min max average median standard deviation		<1	5.33	<1	54	<0.5	<5	0.09	<1	9	53	<1	2.12	5	0.26	0.32	87	<2	0.10	18	288	9	<1	0.1	34	0.15	<1	48	<10	23				
				1	9.44	1989	1809	4.0	<5	2.89	47	172	3523	91	>15.00	30	4.45	3.01	1739	12	2.92	2579	1830	1624	32	0.9	438	0.41	14	197	30	3210				
				8.35	138	758	0.9	<5	1.05	<47	27	346	26	5.97	10	3.29	1.55	631	5	0.88	171	629	92	4	0.3	217	0.28	<14	108	<10	236					
				<1	8.66	7	683	0.6	<5	0.39	<1	20	236	18	5.31	5	3.57	1.87	632	4	0.59	68	552	24	2	0.2	216	0.27	<1	113	<10	96				
				0.1	1.03	434	345	0.9	n/a	1.01	n/a		n/a		32	687	25	3.19	7	0.99	0.84	357	3	0.74	514	307	326	7	0.2	105	0.08	n/a	47	5	636	

Table 3-2
Elemental Analysis Results
Meadowbank Project
Cumberland Resources Ltd.

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		Ag (ppm)	Al (%)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Ca (%)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)	Fe (%)	Hg (ppb)	K (%)	Mg (%)	Mn (ppm)	Mo (ppm)	Na (%)	Ni (ppm)	P (ppm)	Pb (ppm)	Sb (ppm)	Se (ppm)	Sr (ppm)	Ti (%)	U (ppm)	V (ppm)	W (ppm)	Zn (ppm)
				from	to	from	to																													
Starter Pit Rock	IF	TP285-01 [#]	3+00N	4	7	138	135	<1	1.68	1041	14	0.7	9	0.34	<1	17	206	91	>15.00	10	0.04	1.19	1217	<2	0.08	64	1216	32	7	0.2	32	0.05	12	53	<10	134
Starter Pit Rock	IF	TP282-01 [#]	3+25N	8	11	135	132	<1	1.07	53	20	0.5	10	0.41	<1	3	117	31	>15.00	-	0.08	1.13	1370	<2	0.15	24	1740	26	-	-	34	0.04	-	53	<10	78
Starter Pit Rock	IF	TP371-01 [#]	(3P2) 1+40N	7	10	134	131	<1	0.20	484	15	1.3	16	0.32	<1	<1	166	<1	>15.00	5	0.03	0.98	849	<2	0.04	48	1464	38	8	0.1	33	<0.01	31	43	<10	101
Starter Pit Rock	IF	TP283-01 [#]	3+00N	8	11	133	130	<1	0.29	<1	15	0.9	10	0.36	<1	<1	208	5	>15.00	20	0.04	0.97	1322	<2	0.06	32	1396	23	5	0.1	25	<0.01	29	34	<10	90
Starter Pit Rock	IF	TP382-01	2+63N	8	11	131	128	<1	1.67	<1	84	0.8	7	0.24	<1	3	286	19	>15.00	15	0.28	0.52	375	3	0.07	25	1004	21	6	0.1	28	0.03	12	29	<10	49
Starter Pit Rock	IF	TP032-01	3+25N	5	9	131	127	<1	0.39	<1	36	1.4	16	0.32	<1	2	257	<1	>15.00	60	0.07	0.55	707	<2	0.10	31	1489	40	8	0.1	28	<0.01	33	38	<10	53
Starter Pit Rock	IF	TP374-01	(3P2) 1+00N	25	29	121	126	<1	0.17	<1	28	1.3	22	0.25	<1	<1	122	<1	>15.00	5	0.07	0.73	532	<2	0.12	32	699	46	9	0.1	37	<0.01	48	40	24	67
Starter Pit Rock	IF	TP092-01	(3P2) 3+40N	10	13	126	123	<1	0.99	<1	16	1.9	7	0.24	<1	<1	159	10	>15.00	5	0.09	1.16	758	6	0.05	35	1081	35	5	<0.1	28	0.02	21	40	<10	80
Starter Pit Rock	IF	TP151-01	(3P2) 3+40N	29	32	125	122	<1	2.66	<1	179	0.7	5	0.41	<1	8	170	15	>15.00	10	0.68	1.18	871	<2	0.17	37	1570	60	7	0.1	97	0.10	26	66	<10	107
Starter Pit Rock	IF	TP194-01	(3P2) 1+00N	18	22	122	118	<1	0.17	357	12	0.8	20	0.29	<1	6	285	14	>15.00	5	0.02	0.49	508	<2	0.03	41	1183	27	8	0.1	25	<0.01	26	32	<10	33
Starter Pit Rock	IF	TP282-03	3+25N	24	28	122	118	1	1.30	4	50	1.0	15	0.17	<1	6	147	9	>15.00	-	0.18	0.97	990	<2	0.15	32	940	146	-	-	48	0.03	-	47	<10	80
Starter Pit Rock	IF	TP286-01	1+80N	29	33	122	118	<1	0.20	<1	20	0.7	19	0.41	<1	<1	136	<1	>15.00	15	0.06	1.02	829	<2	0.08	24	1557	37	5	0.1	64	<0.01	36	37	<10	72
Starter Pit Rock	IF	TP370-01	(3P2) 1+00N	20	24	122	118	2	0.19	<1	17	1.4	14	0.53	<1	1	124	7	>15.00	5	0.06	1.40	1100	<2	0.04	76	695	42	6	0.1	35	<0.01	29	48	<10	92
Starter Pit Rock	IF	TP042-02	0+80S	30	34	120	116	<1	0.44	<1	24	1.6	15	0.34	<1	<1	119	<1	>15.00	5	0.07	1.58	2168	<2	0.13	67	738	38	8	0.1	29	0.01	37	90	<10	106
Starter Pit Rock	IF	TP371-02	(3P2) 1+40N	26	30	117	113	<1	0.57	53	16	0.9	11	0.15	<1	5	272	19	>15.00	10	0.05	1.03	1080	<2	0.06	162	727	30	5	0.1	12	0.02	7	38	<10	84
Starter Pit Rock	IF	TP023-01	3+25N	35	39	110	106	<1	1.81	36	20	1.0	15	0.19	<1	4	117	<1	>15.00	25	0.13	1.15	740	<2	0.16	37	900	20	-	-	28	0.07	-	53	<10	82
Starter Pit Rock	IF	TP291-02	(3P2) 1+80N	55	60	105	102	<1	3.34	<1	90	1.0	<5	0.58	1	5	114	<1	>15.00	-	0.63	1.89	655	2	0.07	41	1290	34	-	-	34	0.10	-	46	10	92
Starter Pit Rock	IF	TP379-01	(3P2) 1+80N	10	13	105	102	<1	0.36	<1	22	0.8	19	0.19	<1	<1	181	<1	>15.00	15	0.05	0.74	503	<2	0.07	29	1062	36	8	0.1	26	0.01	40	41	12	60
Starter Pit Rock	IF	TP205-02	(3P2) 2+20N	92	95	80	77	<1	0.48	<1	13	<0.5	9	1.13	<1	3	217	1	>15.00	45	0.05	0.99	873	<2	0.05	31	1467	31	9	0.1	43	0.02	34	42	<10	48
min								<1	0.17	<1	12	<0.5	<5	0.15	<1	<1	114	<1	>15.00	5	0.02	0.49	375	<2	0.03	24	695	20	5	<0.1	12	<0.01	7	29	<10	33
max								2	3.34	1041	179	1.9	22	1.13	1	17	286	91	>15.00	60	0.68	1.89	2168	6	0.17	162	1740	146	9	0.2	97	0.10	48	90	24	134
average								<1	0.95	107	36	1.0	13	0.36	<1	4	179	12	>15.00	16	0.14	1.04	918	<2	0.09	46	1169	40	7	0.1	36	0.03	28	46	<10	79
median								<1	0.48	<1	20	0.9	14	0.32	<1	3	166	5	>15.00	10	0.07	1.02	849	<2	0.07	35	1183	35	7	0.1	32	0.02	29	42	<10	80
standard deviation								0.4	0.92	262	41	0.4	5	0.22	n/a	4	60	21	n/a	16	0.19	0.35	412	<2	0.04	32	332	27	1	0.03	18	0.03	11	14	5	25

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

min	0.1	0.06	<1	4	0.1	<5	0.05	0.1	<1	88	<1	5.73	10	0.01	0.08	98	<2	0.01	12	160	8	4	-	2	<0.01	20	9	1	12
max	2	4.15	1950	140	2.0	35	4.01	2	57	2674	1588	>15.00	20	0.66	12.07	2045	38	0.23	1161	1510	66	21	-	176	0.10	60	146	50	354
average	<1	1.15	133	34	0.8	15	0.60	<1	6	296	70	14.04	15	0.14	1.63	831	3	0.09	104	934	30	10	-	41	0.03	34	45	10	74
median	<1	0.73	3	30	0.5	15	0.33	<1	3	149	<1	>15.00	15	0.11	1.01	750	1	0.07	31	960	30	4	-	29	0.02	21	40	<10	52
standard deviation	0.3	1.00	395	32	0.5	10	0.93	0.5	13	569	305	2.66	5	0.14	2.27	584	7	0.06	261	388	13	10	-	38	0.02	23	26	13	72

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		Ag (ppm)	Al (%)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Ca (%)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)	Fe (%)	Hg (ppb)	K (%)	Mg (%)	Mn (ppm)	Mo (ppm)	Na (%)	Ni (ppm)	P (ppm)	Pb (ppm)	Sb (ppm)	Se (ppm)	Sr (ppm)	Ti (%)	U (ppm)	V (ppm)	W (ppm)	Zn (ppm)
				from	to	from	to																													
Starter Pit Rock	UM	TP005-01 [#]	(3P2) 2+60N	13	16	133	130	<1	3.72	<1	50	<0.5	<5	3.65	<1	65	2045	3	6.98	10	0.17	14.15	897	<2	0.36	1290	143	27	14	0.2	90	0.10	6	143	<10	70
Starter Pit Rock	UM	TP001-01	(3P2) 2+20N	16	20	131	127	<1	4.06	<1	52	<0.5	<5	3.74	<1	67	2259	33	7.50	5	0.16	14.53	1233	<2	0.34	1212	168	24	15	0.2	128	0.19	7	153	<10	66
Starter Pit Rock	UM	TP008-01	(3P2) 3+00N	13	17	127	124	<1	3.83	<1	45	<0.5	<5	2.06	<1	68	2205	21	7.19	5	0.15	>15.00	796	<2	0.32	1339	152	34	14	0.3	86	0.18	4	143	<10	74
Starter Pit Rock	UM	TP041-01	0+40S	19	23	121	117	<1	5.26	<1	192	<0.5	<5	3.61	<1	83	3057	<1	9.75	5	1.65	10.61	1305	<2	0.45	1458	174	12	26	0.1	38	0.21	7	189	<10	87
Starter Pit Rock	UM	TP026-01	0+80S	35	39	118	114	<1	4.47	<1	45	<0.5	<5	2.61	<1	70	2129	23	7.98	5	0.16	14.79	1069	<2	0.36	1133	179	20	14	0.2	62	0.18	3	170	<10	87
Starter Pit Rock	UM	TP373-01	(3P2) 1+00N	26	30	117	113	<1	4.29	<1	48	<0.5	<5	2.07	<1	78	2501	104	7.84	20	0.15	>15.00	982	<2	0.34	1379	154	21	16	0.2	65	0.20	3	159	<10	79
Starter Pit Rock	UM	TP377-01	(3P2) 1+40N	26	30	117	112	<1	5.11	10	179	0.6	<5	4.62	<1	130	2790	8	10.62	15	1.06	11.33	1826	<2	0.41	2128	174	19	22	0.7	32	0.17	7	182	<10	109
Starter Pit Rock	UM	TP001-02	(3P2) 2+20N	37	41	115	111	<1	3.05	<1	45	<0.5	<5	4.85	<1	62	1917	34	6.29	5	0.13	14.25	1358	<2	0.28	1313	122	15	22	0.2	243	0.15	11	112	<10	58
Starter Pit Rock	UM	TP462-01	1+50N	25	30	114	109	<1	4.16	<1	169	<0.5	<5	5.64	<1	74	2115	7	7.82	5	0.92	12.12	1333	<2	0.46	1069	214	18	16	0.2	102	0.17	6	176	<10	77
Starter Pit Rock	UM	TP085-02	1+20S	52	55	106	103	<1	3.29	<1	43	<0.5	<5	4.29	<1	67	1971	<1	7.00	10	0.13	>15.00	1417	<2	0.28	1318	158	25	9	0.1	154	0.15	11	122	<10	83
Starter Pit Rock	UM	TP261-01	1+80N	34	38	107	103	<1	3.67	<1	40	<0.5	<5	4.00	<1	62	2192	7	7.57	5	0.08	14.30	1363	<2	0.17	1131	172	23	18	0.2	52	0.12	7	136	<10	123
Starter Pit Rock	UM	TP371-03	(3P2) 1+40N	43	47	102	98	<1	4.04	<1	43	<0.5	<5	3.40	<1	69	2225	35	7.47	5	0.14	>15.00	1133	<2	0.30	1174	172	22	13	0.3	150	0.18	9	151	<10	70
Starter Pit Rock	UM	TP376-01	(3P2) 1+40N	56	60	102	98	<1	3.77	<1	46	<0.5	<5	3.82	<1	73	2230	69	7.51	10	0.14	>15.00	1192	<2	0.30	1379	145	14	12	0.2	169	0.18	9	143	<10	69
Starter Pit Rock	UM	TP464-02	0+95N	40	45	101	96	<1	3.50	<1	52	<0.5	<5	5.68	<1	65	2057	43	6.81	10	0.22	13.69	1539	<2	0.32	1224	140	21	9	0.2	180	0.16	12	126	<10	68
Starter Pit Rock	UM	TP380-01	(3P2) 1+80N	45	49	100	95	<1	4.21	2	180	0.5	<5	2.70	1	74	2738	53	9.88	-	1.02	8.65	1435	<2	0.22	1800	150	10	-	-	44	0.21	-	165	<10	106
Starter Pit Rock	UM	TP370-03	(3P2) 1+00N	55	59	90	86	<1	3.46	<1	42	<0.5	<5	2.93	<1	70	2195	41	7.03	15	0.10	14.91	1027	<2	0.21	1369	149	21	13	0.1	102	0.15	8	130	<10	70
min max average median standard deviation								<1	3.05	<1	40	<0.5	<5	2.06	<1	62	1917	<1	6.29	5	0.08	8.65	796	<2	0.17	1069	122	10	9	0.1	32	0.10	3	112	<10	58
								<1	5.26	10	192	0.6	<5	5.68	1	130	3057	104	10.62	20	1.65	>15.00	1826	<2	0.46	2128	214	34	26	0.7	243	0.21	12	189	<10	123
								<1	3.99	1	79	<0.5	<5	3.73	<1	74	2289	30	7.83	9	0.40	13.65	1244	<2	0.32	1357	160	20	15	0.2	106	0.17	7	150	<10	81
								<1	3.94	<1	47	<0.5	<5	3.70	<1	70	2200	28	7.51	5	0.16	14.42	1269	<2	0.32	1316	156	21	14	0.2	96	0.18	7	147	<10	76
								n/a	0.60	2	60	0.1	n/a	1.11	n/a	16	319	28	1.21	5	0.48	1.93	260	n/a	0.08	267	21	6	4	0.1	60	0.03	3	22	n/a	16

Table 3-3
Acid-Base Accounting Analysis Results
Meadowbank Project
Cumberland Resources Ltd.

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		PASTE pH	S(T) (%)	S(SO ₄) (%)	AP	NP	NET NP	NP/AP	TIC (%)	CARBONATE NP	SIDERITE-CORRECTED NP	ARD Potential NPR
				from	to	from	to											
Airstrip - Overburden	Till	59545	-	0	1.1	-	-	8.6	<0.01	<0.01	<0.3	25.1	24.8	>80.4	0.25	20.8	-	NPAG
Airstrip - Overburden	Till	59544	-	0	1.4	-	-	8.6	<0.01	<0.01	<0.3	14.0	13.7	>44.8	0.13	10.8	-	NPAG
Airstrip - Overburden	Till	2015	-	1.2	2.7	-	-	9.3	<0.01	<0.01	<0.3	57.4	57.1	>183.6	0.62	51.7	-	NPAG
<i>min</i> <i>max</i> <i>average</i> <i>median</i> <i>standard deviation</i>								8.6	<0.01	<0.01	<0.3	14.0	13.7	>44.8	0.13	10.8	-	-
								9.3	<0.01	<0.01	<0.3	57.4	57.1	>183.6	0.62	51.7	-	-
								8.7	<0.01	<0.01	<0.3	32.2	31.9	>102.9	0.33	27.8	-	-
								8.6	<0.01	<0.01	<0.3	25.1	24.8	>80.4	0.25	20.8	-	-
								0.4	n/a	n/a	n/a	22.5	22.5	>72.1	0.26	21.3	-	-

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		PASTE pH	S(T) (%)	S(SO ₄) (%)	AP	NP	NET NP	NP/AP	TIC (%)	CARBONATE NP	SIDERITE-CORRECTED NP	ARD Potential NPR
				from	to	from	to											
Airstrip - Rock	IV	AIR - 001	-			Surface	-	7.3	<0.01	<0.01	<0.3	55.4	55.1	>177.2	0.58	48.3	-	NPAG
Airstrip - Rock	IV	AIR - 002	-			Surface	-	7.8	<0.01	<0.01	<0.3	59.1	58.8	>189.2	0.63	52.5	-	NPAG
Airstrip - Rock	IV	AIR - 003	-			Surface	-	8.7	<0.01	<0.01	<0.3	60.8	60.4	>194.4	0.66	55.0	-	NPAG
Airstrip - Rock	IV	AIR - 004	-			Surface	-	9.1	<0.01	<0.01	<0.3	94.3	93.9	>301.6	1.04	86.7	-	NPAG
Airstrip - Rock	IV	AIR - 005	-			Surface	-	9.3	<0.01	<0.01	<0.3	72.5	72.2	>232.0	0.77	64.2	-	NPAG
Airstrip - Rock	IV	AIR - 006	-			Surface	-	9.3	<0.01	<0.01	<0.3	69.4	69.1	>222.0	0.71	59.2	-	NPAG
Airstrip - Rock	IV	AIR - 007	-			Surface	-	9.2	<0.01	<0.01	<0.3	92.1	91.8	>294.8	0.92	76.7	-	NPAG
Airstrip - Rock	IV	AIR - 008	-			Surface	-	8.9	<0.01	<0.01	<0.3	50.3	49.9	>160.8	0.50	41.7	-	NPAG
Airstrip - Rock	IV	AIR - 009	-			Surface	-	9.2	<0.01	<0.01	<0.3	70.1	69.8	>224.4	0.71	59.2	-	NPAG
Airstrip - Rock	IV	AIR - 010	-			Surface	-	9.0	<0.01	<0.01	<0.3	41.6	41.3	>133.2	0.37	30.8	-	NPAG
<i>min</i> <i>max</i> <i>average</i> <i>median</i> <i>standard deviation</i>								7.3	<0.01	<0.01	<0.3	41.6	41.3	>133.2	0.37	30.8	-	-
								9.3	<0.01	<0.01	<0.3	94.3	93.9	>301.6	1.04	86.7	-	-
								8.8	<0.01	<0.01	<0.3	66.6	66.2	>213.0	0.69	57.4	-	-
								9.1	<0.01	<0.01	<0.3	65.1	64.8	>208.2	0.69	57.1	-	-
								0.7	n/a	n/a	n/a	16.9	16.9	>54.2	0.19	16.1	-	-

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		PASTE pH	S(T) (%)	S(SO ₄) (%)	AP	NP	NET NP	NP/AP	TIC (%)	CARBONATE NP	SIDERITE-CORRECTED NP	ARD Potential NPR
				from	to	from	to											
Starter Pit Rock	IV	TP205-01#	(3P2) 2+20N	4	7	139	136	9.3	0.01	<0.01	0.3	7.7	7.4	24.6	<0.01	0.8	-	NPAG
Starter Pit Rock	IV	TP282-02	3+25N	13	16	129	126	9.3	0.11	N/A	3.4	6.4	2.9	1.9	0.02	1.7	-	Uncertain
Starter Pit Rock	IV	TP042-01	0+80S	17	21	129	125	7.9	0.66	0.02	20.0	4.2	-15.8	0.2	<0.01	0.8	-	PAG
Starter Pit Rock	IV	TP091-01	(3P2) 3+40N	11	14	128	125	8.9	<0.01	<0.01	0.3	6.0	5.7	19.2	<0.01	0.8	-	NPAG
Starter Pit Rock	IV	TP316-01	3+00N	17	21	128	124	8.8	0.26	<0.01	8.1	8.4	0.3	1.0	0.01	0.8	9.3	Uncertain
Starter Pit Rock	IV	TP469-01	(3P2) 2+60N	26	30	128	124	8.9	0.04	<0.01	1.3	10.1	8.8	8.1	0.02	1.7	-	NPAG
Starter Pit Rock	IV	TP005-02	(3P2) 2+60N	22	25	126	123	7.7	0.82	0.01	25.3	4.0	-21.3	0.2	<0.01	0.8	-	PAG
Starter Pit Rock	IV	TP030-01	3+00N	8	12	126	122	9.3	0.12	<0.01	3.8	6.1	2.4	1.6	<0.01	0.8	6.6	Uncertain
Starter Pit Rock	IV	TP085-01	1+20S	27	30	123	120	9.4	0.01	<0.01	0.3	5.4	5.1	17.2	<0.01	0.8	-	NPAG
Starter Pit Rock	IV	TP464-01	0+95N	15	20	125	120	9.2	0.13	<0.01	4.1	7.8	3.7	1.9	<0.01	0.8	6.8	Uncertain
Starter Pit Rock	IV	TP317-01	3+25N	25	29	122	118	9.5	0.07	<0.01	2.2	17.5	15.3	8.0	0.12	10.0	-	NPAG
Starter Pit Rock	IV	TP151-02	(3P2) 3+40N	38	42	118	114	9.7	0.20	<0.01	6.3	20.3	14.0	3.2	0.13	10.8	-	NPAG
Starter Pit Rock	IV	TP314-01	2+63N	31	35	117	113	9.6	0.22	<0.01	6.9	36.5	29.6	5.3	0.35	29.2	-	NPAG
Starter Pit Rock	IV	TP004-01	(3P2) 3+00N	30	34	114	111	9.7	0.03	<0.01	0.9	5.9	5.0	6.3	<0.01	0.8	-	NPAG
Starter Pit Rock	IV	TP204-01	1+20S	37	41	115	111	9.0	0.14	<0.01	4.4	7.4	3.0	1.7	0.02	1.7	13.1	Uncertain
Starter Pit Rock	IV	TP469-02	(3P2) 2+60N	48	52	112	108	9.8	0.17	<0.01	5.3	11.6	6.3	2.2	0.02	1.7	12.8	NPAG
Starter Pit Rock	IV	TP282-04	3+25N	37	40	110	107	9.9	0.22	N/A	6.9	24.3	17.4	3.5	0.21	17.5	-	NPAG
Starter Pit Rock	IV	TP370-02	(3P2) 1+00N	31	35	112	107	9.2	0.04	<0.01	1.3	3.5	2.3	2.8	<0.01	0.8	-	NPAG
Starter Pit Rock	IV	TP041-02	0+40S	61	65	97	93	10.0	0.14	<0.01	4.4	25.8	21.4	5.9	0.21	17.5	143.8	NPAG
Starter Pit Rock	IV	TP287-01	1+80N	48	52	97	93	9.7	0.34	<0.01	10.6	11.6	0.9	1.1	0.03	2.5	13.0	Uncertain
Starter Pit Rock	IV	TP291-01	(3P2) 1+80N	75	79	91	88	9.5	0.11	N/A	3.4	17.0	13.6	4.9	0.11	9.2	-	NPAG
Starter Pit Rock	IV	TP379-02	(3P2) 1+80N	62	65	91	88	8.5	0.13	0.02	3.4	7.2	3.8	2.1	<0.01	0.8	-	NPAG
Starter Pit Rock	IV	TP026-02	0+80S	76	80	90	86	9.2	0.10	<0.01	3.1	16.4	13.3	5.2	0.09	7.5	-	NPAG
Starter Pit Rock	IV	TP205-03	(3P2) 2+20N	108	110	70	68	9.7	0.18	<0.01	5.6	14.6	8.9	2.6	0.06	5.0	-	NPAG
<i>min</i> <i>max</i> <i>average</i> <i>median</i> <i>standard deviation</i>								7.7	<0.01	<0.01	0.3	3.5	-21.3	0.2	<0.01	0.8	6.6	-
								10.0	0.82	0.02	25.3	36.5	29.6	24.6	0.35	29.2	143.8	-
								8.7	0.18	<0.01	5.5	11.9	6.4	5.4	0.06	5.2	29.3	-
								9.3	0.13	<0.01	3.9	8.1	5.4	3.0	0.02	1.7	12.8	-
								0.6	0.19	n/a	6.0	8.3	10.5	6.3	0.09	7.3	50.6	-

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

<i>min</i>	8.3	<0.01	<0.01	0.0	1.8	-49.2	<0.1	0.00	0.8	-	-
<i>max</i>	10.1	1.66	0.06	51.9	142.8	140.6	>344.4	4.01	334.2	-	-
<i>average</i>	9.5	0.26	<0.01	8.0	22.4	14.4	17.7	0.36	34.0	-	-
<i>median</i>	9.4	0.11	<0.01	3.4	8.8	4.3	5.0	0.06	8.3	-	-
<i>standard deviation</i>	0.4	0.36	0.01	11.3	33.3	36.5	53.0	0.75	65.3	-	-

Table 3-3
Acid-Base Accounting Analysis Results
Meadowbank Project
Cumberland Resources Ltd.

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		PASTE pH	S(T) (%)	S(SO ₄) (%)	AP	NP	NET NP	NP/AP	TIC (%)	CARBONATE NP	SIDERITE-CORRECTED NP	ARD Potential NPR
				from	to	from	to											
Starter Pit Rock	IF	TP285-01 [#]	3+00N	4	7	138	135	7.7	1.16	0.07	34.1	6.9	-27.2	0.2	0.07	5.8	-	PAG
Starter Pit Rock	IF	TP282-01 [#]	3+25N	8	11	135	132	7.8	0.59	0.04	17.2	8.4	-8.8	0.5	0.12	10.0	-	PAG
Starter Pit Rock	IF	TP371-01 [#]	(3P2) 1+40N	7	10	134	131	7.2	0.58	0.09	15.3	5.9	-9.4	0.4	0.02	1.7	-	PAG
Starter Pit Rock	IF	TP283-01 [#]	3+00N	8	11	133	130	8.2	0.85	0.11	23.1	9.1	-14.1	0.4	0.08	6.7	-	PAG
Starter Pit Rock	IF	TP382-01	2+63N	8	11	131	128	8.3	0.35	0.03	10.0	6.0	-4.0	0.6	<0.01	0.8	-	PAG
Starter Pit Rock	IF	TP032-01	3+25N	5	9	131	127	7.2	0.69	0.09	18.8	6.4	-12.4	0.3	0.04	3.3	-	PAG
Starter Pit Rock	IF	TP374-01	(3P2) 1+00N	25	29	121	126	8.8	0.37	0.10	8.4	6.6	-1.9	0.8	0.07	5.8	-	PAG
Starter Pit Rock	IF	TP092-01	(3P2) 3+40N	10	13	126	123	8.0	1.19	0.06	35.3	6.3	-29.0	0.2	0.03	2.5	-	PAG
Starter Pit Rock	IF	TP151-01	(3P2) 3+40N	29	32	125	122	8.2	1.51	0.10	44.1	13.9	-30.1	0.3	0.05	4.2	16.0	PAG
Starter Pit Rock	IF	TP194-01	(3P2) 1+00N	18	22	122	118	7.7	0.78	0.07	22.2	6.8	-15.4	0.3	0.07	5.8	-	PAG
Starter Pit Rock	IF	TP282-03	3+25N	24	28	122	118	7.3	1.82	0.06	55.0	4.2	-50.8	0.1	0.15	12.5	-	PAG
Starter Pit Rock	IF	TP286-01	1+80N	29	33	122	118	8.3	1.17	0.13	32.5	9.6	-22.9	0.3	0.07	5.8	-	PAG
Starter Pit Rock	IF	TP370-01	(3P2) 1+00N	20	24	122	118	8.5	0.90	0.10	25.0	16.5	-8.5	0.7	0.25	20.8	20.0	PAG
Starter Pit Rock	IF	TP042-02	0+80S	30	34	120	116	8.3	0.77	0.12	20.3	7.8	-12.6	0.4	0.07	5.8	9.3	PAG
Starter Pit Rock	IF	TP371-02	(3P2) 1+40N	26	30	117	113	7.4	0.92	0.08	26.3	5.3	-21.0	0.2	<0.01	0.8	-	PAG
Starter Pit Rock	IF	TP023-01	3+25N	35	39	110	106	8.2	0.71	0.03	21.3	7.4	-13.9	0.3	0.02	1.7	-	PAG
Starter Pit Rock	IF	TP291-02	1+80N	55	60	105	102	8.9	0.06	0.01	1.6	17.8	16.2	11.4	0.15	12.5	-	NPAG
Starter Pit Rock	IF	TP379-01	(3P2) 1+80N	10	13	105	102	7.6	2.50	0.19	72.2	3.6	-68.6	<0.1	0.02	1.7	-	NPAG
Starter Pit Rock	IF	TP205-02	(3P2) 2+20N	92	95	80	77	8.8	0.23	0.04	5.9	42.1	36.1	7.1	0.45	37.5	39.0	NPAG
<i>min</i>								7.2	0.06	0.01	1.6	3.6	-68.6	<0.1	<0.01	0.8	9.3	-
<i>max</i>								8.9	2.50	0.19	72.2	42.1	36.1	7.1	0.45	37.5	39.0	-
<i>average</i>								7.7	0.90	0.08	25.7	10.0	-15.7	1.3	0.09	7.7	21.1	-
<i>median</i>								8.2	0.78	0.08	22.2	6.9	-13.9	0.3	0.07	5.8	18.0	-
<i>standard deviation</i>								0.5	0.58	0.04	17.3	8.7	22.1	2.9	0.11	8.8	12.7	-

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

<i>min</i>	5.0	<0.01	<0.01	<0.3	0.6	-138.3	<0.1	<0.01	0.8	-	-
<i>max</i>	9.5	5.44	0.20	169.4	243.4	243.1	>779.0	2.78	231.7	-	-
<i>average</i>	8.8	1.22	0.06	36.6	22.1	-14.5	30.0	0.35	28.8	-	-
<i>median</i>	8.4	0.94	0.05	27.5	6.0	-9.7	0.3	0.07	5.8	-	-
<i>standard deviation</i>	0.9	1.48	0.05	45.5	53.4	63.5	149.7	0.70	58.6	-	-

Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		PASTE pH	S(T) (%)	S(SO ₄) (%)	AP	NP	NET NP	NP/AP	TIC (%)	CARBONATE NP	SIDERITE-CORRECTED NP	ARD Potential NPR
				from	to	from	to											
Starter Pit Rock	UM	TP005-01 [#]	(3P2) 2+60N	13	16	133	130	9.3	<0.01	<0.01	0.3	129.3	128.9	413.6	1.54	128.3	-	NPAG
Starter Pit Rock	UM	TP001-01	(3P2) 2+20N	16	20	131	127	9.3	<0.01	<0.01	0.3	144.3	143.9	461.6	1.83	152.5	-	NPAG
Starter Pit Rock	UM	TP008-01	(3P2) 3+00N	13	17	127	124	9.4	0.09	<0.01	2.8	95.9	93.1	34.1	1.16	96.7	-	NPAG
Starter Pit Rock	UM	TP041-01	0+40S	19	23	121	117	9.2	<0.01	<0.01	0.3	107.0	106.7	342.4	1.10	91.7	-	NPAG
Starter Pit Rock	UM	TP026-01	0+80S	35	39	118	114	9.1	<0.01	<0.01	0.3	97.0	96.7	310.4	1.17	97.5	-	NPAG
Starter Pit Rock	UM	TP373-01	(3P2) 1+00N	26	30	117	113	9.3	0.01	<0.01	0.3	91.0	90.7	291.2	1.11	92.5	-	NPAG
Starter Pit Rock	UM	TP377-01	(3P2) 1+40N	26	30	117	112	9.2	0.04	<0.01	1.3	92.5	91.3	74.0	0.94	78.3	-	NPAG
Starter Pit Rock	UM	TP001-02	(3P2) 2+20N	37	41	115	111	9.5	<0.01	<0.01	0.3	212.0	211.7	678.4	2.91	242.5	-	NPAG
Starter Pit Rock	UM	TP462-01	1+50N	25	30	114	109	9.4	<0.01	<0.01	0.3	122.8	122.4	392.8	1.40	116.7	-	NPAG
Starter Pit Rock	UM	TP085-02	1+20S	52	55	106	103	9.3	<0.01	<0.01	0.3	191.3	190.9	612.0	2.41	200.8	-	NPAG
Starter Pit Rock	UM	TP261-01	1+80N	34	38	107	103	9.1	0.08	<0.01	2.5	179.9	177.4	72.0	2.20	183.3	-	NPAG
Starter Pit Rock	UM	TP371-03	(3P2) 1+40N	43	47	102	98	9.5	0.11	<0.01	3.4	142.0	138.6	41.3	1.74	145.0	-	NPAG
Starter Pit Rock	UM	TP376-01	(3P2) 1+40N	56	60	102	98	9.3	0.02	<0.01	0.6	165.3	164.6	264.4	1.81	150.8	-	NPAG
Starter Pit Rock	UM	TP464-02	0+95N	40	45	101	96	9.2	0.02	<0.01	0.6	212.9	212.3	340.6	2.74	228.3	-	NPAG
Starter Pit Rock	UM	TP380-01	(3P2) 1+80N	45	49	100	95	9.2	0.27	N/A	8.4	73.1	64.7	8.7	0.80	66.7	-	NPAG
Starter Pit Rock	UM	TP370-03	(3P2) 1+00N	55	59	90	86	9.3	0.01	<0.01	0.3	118.3	117.9	378.4	1.45	120.8	-	NPAG
<i>min</i>								9.1	0.01	0.01	0.3	73.1	64.7	8.7	0.80	66.7	-	-
<i>max</i>								9.5	0.27	0.01	8.4	212.9	212.3	678.4	2.91	242.5	-	-
<i>average</i>								9.3	0.04	0.01	1.4	135.9	134.5	294.7	1.64	137.0	-	-
<i>median</i>								9.3	0.01	0.01	0.3	126.0	125.7	325.5	1.50	124.6	-	-
<i>standard deviation</i>								0.1	0.07	0.00	2.1	44.7	45.5	204.0	0.64	53.3	-	-

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

<i>min</i>	8.6	<0.01	<0.01	0.0	7.0	-29.3	0.2	0.04	3.3	-	-
<i>max</i>	9.9	3.08	0.02	96.3	273.4	273.1	>875.0	3.99	332.5	-	-
<i>average</i>	9.4	0.21	<0.01	6.4	101.3	94.9	157.8	1.41	117.9	-	-
<i>median</i>	9.4	0.04	<0.01	1.1	89.2	88.9	56.7	1.23	102.5	-	-
<i>standard deviation</i>	0.2	0.55	0.00	17.2	65.2	63.7	206.8	0.97	80.4	-	-

Method Detection Limit								PASTE pH	S(T) (%)	S(SO ₄) (%)	AP	NP	NET NP	NP/AP	TIC (%)	CARBONATE NP	SIDERITE-CORRECTED NP	ARD Potential NPR
CEMI								0.01	0.01	0.01	0.3	-	-	-	0.01	0.8*	-	-

NOTES:

[#] samples located above 130 m elevation (estimated maximum bench elevation to be mined within the first year or pre-production).

AP = Acid potential in tonnes CaCO₃ equivalent per 1000 tonnes of material. AP is determined from calculated sulphide sulphur content: S(T) - S(SO₄),

assuming total conversion of sulphide to sulphate.

Where S(SO₄) is reported as <0.01%, it is assumed to be zero for the AP calculation

NP = Neutralization potential in tonnes CaCO₃ equivalent per 1000 tonnes of material.

NET NP = Net neutralization potential in tonnes CaCO₃ equivalent per 1000 tonnes of material.

TIC = Total Inorganic Carbon as %C.

Carbonate NP calculated from TIC assay. TIC value of 0.01 is used in calculation if TIC <0.01%.

Sulphate sulphur (S(SO₄)) analyses were only completed if total sulphur (S(T)) content was >0.3%.

Where S(T) is reported as 0.01%, a S(T) value of 0.01% is used for the AP calculation.

Where S(SO₄) is reported as 0.01%, it is assumed to be zero for the AP calculation. (ie. if S(SO₄) is less than 0.01% or is not analyzed, AP is calculated from S(T) only)

Non-detect values assumed to be equal to one half the detection limit in calculations of average, median and standard deviation, where applicable.

* Value assigned to samples with non-detect TIC.

- = Not analyzed.

N/A = Not available.

< = Less than analytical detection limit

Table 3-4
Shake Flask Extraction Leachate Concentrations
Meadowbank Project
Cumberland Resources Ltd.

CCME (CEQG) (freshwater aquatic life)** (mg/L)										6.5 - 9.0								0.00010	0.005 - 0.1	0.005						0.000017		0.001 / 0.0089	0.002 - 0.004	0.3	
Metal Mine Effluent Regulation (MMER) ^{6mm} (mg/L)										6.0 - 9.5											0.5										0.3
Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		pH (s.u.)	Conductivity (uS/cm)	Acidity - pH 4.5 (mg/L as CaCO3)	Acidity - pH 8.3 (mg/L as CaCO3)	Alkalinity (mg/L as CaCO3)	Sulphate (mg/L)	Calculated Hardness (mg/L as CaCO3)	Ag (mg/L)	Al ¹ (mg/L)	As (mg/L)	B (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	Ca (mg/L)	Cd ²⁺ (mg/L)	Co (mg/L)	Cr ² (mg/L)	Cu ³ (mg/L)	Fe (mg/L)				
Airstrip - Overburden	Till	59545	-	0	1.1	-	-	8.0	114	0	2	57	3	49	<0.00001	0.267	0.0006	<0.010	0.00906	<0.0005	<0.0005	16.1	<0.00005	0.00030	0.00060	0.0160	0.23				
Airstrip - Overburden	Till	59544	-	0	1.4	-	-	8.0	108	0	2	53	5	46	<0.00001	0.389	0.0005	<0.010	0.00958	<0.0005	<0.0005	14.9	<0.00005	0.00020	0.00080	0.0086	0.38				
Airstrip - Overburden	Till	2015	-	1.2	2.7	-	-	8.1	135	0	1	69	3	54	<0.00001	0.090	0.0006	<0.010	0.00582	<0.0005	<0.0005	18.6	<0.00005	<0.00010	<0.00050	0.0111	0.06				
		min						8.0	108	0	1	53	3	46	<0.00001	0.090	0.0005	<0.010	0.00582	<0.0005	<0.0005	14.9	<0.00005	<0.00010	<0.00050	0.0086	0.06				
		max						8.1	135	0	2	69	5	54	<0.00001	0.389	0.0006	<0.010	0.00958	<0.0005	<0.0005	18.6	<0.00005	0.00030	0.00080	0.0160	0.38				
		average						8.0	119	0	1	60	4	50	<0.00001	0.249	0.0006	<0.010	0.00815	<0.0005	<0.0005	16.5	<0.00005	0.00018	0.00055	0.0119	0.22				
		median						8.0	114	0	2	57	3	49	<0.00001	0.267	0.0006	<0.010	0.00906	<0.0005	<0.0005	16.1	<0.00005	0.00020	0.00060	0.0111	0.23				
		standard deviation						0.1	14	0	1	8	1	4	0.000003	0.150	0.0001	n/a	0.00204	n/a	n/a	1.9	n/a	0.00013	0.00028	0.0038	0.16				
Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		pH (s.u.)	Conductivity (uS/cm)	Acidity - pH 4.5 (mg/L as CaCO ₃)	Acidity - pH 8.3 (mg/L as CaCO ₃)	Alkalinity (mg/L as CaCO ₃)	Sulphate (mg/L)	Calculated Hardness (mg/L equiv. CaCO ₃)	Ag (mg/L)	Al ¹ (mg/L)	As (mg/L)	B (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	Ca (mg/L)	Cd ²⁺ (mg/L)	Co (mg/L)	Cr ² (mg/L)	Cu ³ (mg/L)	Fe (mg/L)				
Airstrip - Rock	IV	AIR - 001	-	Surface		-		8.0	116	0	2	62	4	61	<0.00001	0.146	0.003	<0.01	0.008	<0.0005	<0.0005	20.5	<0.00005	<0.0001	<0.0005	0.015	<0.03				
Airstrip - Rock	IV	AIR - 005	-	Surface		-		8.1	113	0	1	65	<3	53	<0.00001	0.216	0.001	<0.01	0.008	<0.0005	<0.0005	18.9	<0.00005	<0.0001	<0.0005	0.001	<0.03				
Airstrip - Rock	IV	AIR - 008	-	Surface		-		8.0	115	0	2	62	<3	59	0.00001	0.117	0.002	0.01	0.009	<0.0005	<0.0005	19.8	<0.00005	0.0001	<0.0005	0.023	0.03				
Airstrip - Rock	IV	AIR - 010	-	Surface		-		8.0	112	0	2	60	<3	55	0.00002	0.151	0.002	<0.01	0.004	<0.0005	<0.0005	19.4	<0.00005	<0.0001	<0.0005	0.013	<0.03				
		min						8.0	112	0	1	60	<3	53	<0.00001	0.117	0.001	<0.01	0.004	<0.0005	<0.0005	18.9	<0.00005	<0.0001	<0.0005	0.001	<0.03				
		max						8.1	116	0	2	65	4	61	0.00002	0.216	0.003	0.01	0.009	<0.0005	<0.0005	20.5	<0.00005	0.0001	<0.0005	0.023	0.03				
		average						8.0	114	0	2	62	<3	57	0.00001	0.158	0.002	<0.01	0.007	<0.0005	<0.0005	19.7	<0.00005	<0.0001	<0.0005	0.013	<0.03				
		median						8.0	114	0	2	62	<3	57	0.00001	0.149	0.002	<0.01	0.008	<0.0005	<0.0005	19.6	<0.00005	<0.0001	<0.0005	0.014	<0.03				
		standard deviation						0.1	2	0	0	2	1	3	0.00001	0.042	0.001	n/a	0.002	n/a	n/a	0.7	n/a	n/a	n/a	0.009	n/a				
CCME (CEQG) (freshwater aquatic life)** (mg/L)										6.5 - 9.0								0.0001	0.005 - 0.1	0.005						0.000017		0.001 / 0.0089	0.002 - 0.004	0.3	
Metal Mine Effluent Regulation (MMER) ^{6mm} (mg/L)										6.0 - 9.5											0.5										
Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		pH (s.u.)	Conductivity (uS/cm)	Acidity (pH4.5) (mg/L as CaCO ₃)	Acidity (pH8.3) (mg/L as CaCO ₃)	Alkalinity (mg/L as CaCO ₃)	Sulfate (mg/L)	Calculated Hardness (mg/L equiv. CaCO ₃)	Ag (mg/L)	Al ¹ (mg/L)	As (mg/L)	B (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	Ca (mg/L)	Cd ²⁺ (mg/L)	Co (mg/L)	Cr ² (mg/L)	Cu ³ (mg/L)	Fe (mg/L)				
Starter Pit Rock	IV	TP316-01	3+00N	17	21	128	124	7.2	33	0	7	9	6	11	<0.00001	0.021	0.0148	0.01	0.0009	<0.0005	<0.0005	2.51	0.00009	0.0018	<0.0005	0.0054	<0.03				
Starter Pit Rock	IV	TP030-01	3+00N	8	12	126	122	6.7	19	0	5	5	4	2	<0.00001	0.016	0.0075	<0.01	0.0005	<0.0005	<0.0005	0.491	<0.00005	0.0006	<0.0005	0.0058	<0.03				
Starter Pit Rock	IV	TP464-01	0+95	15	20	125	120	6.9	12	0	3	6	<3	2	<0.00001	0.040	0.0076	<0.01	0.0008	<0.0005	<0.0005	0.482	<0.00005	0.0002	0.0010	0.0070	<0.03				
Starter Pit Rock	IV	TP317-01	3+25N	25	29	122	118	8.2	81	0	0	43	<3	35	<0.00001	0.237	0.0015	<0.01	0.0017	<0.0005	<0.0005	12.2	<0.00005	<0.0001	<0.0005	0.0006	<0.03				
Starter Pit Rock	IV	TP151-02	3P2 3+40N	38	42	118	114	8.3	99	0	0	49	<3	39	<0.00001	0.128	0.0006	0.01	0.0021	<0.0005	<0.0005	13.9	<0.00005	<0.0001	<0.0005	0.0039	<0.03				
Starter Pit Rock	IV	TP004-01	(3P2) 3+00N	30	34	114	111	6.7	11	0	7	6	<3	0.3	<0.00001	0.021	0.0111	<0.01	0.0003	<0.0005	<0.0005	<0.05	<0.00005	<0.0001	0.0010	0.0053	<0.03				
Starter Pit Rock	IV	TP469-02	(3P2) 2+60N	48	52	112	108	7.8	63	0	2	35	<3	26	<0.00001	0.162	0.0040	<0.01	0.0022	<0.0005	<0.0005	9.24	<0.00005	<0.0001	<0.0005	0.0024	<0.03				
Starter Pit Rock	IV	TP282-04	3+25N	37	40	110	107	8.2	129	0	0	63	<3	50	<0.00001	0.115	0.0007	0.02	0.0034	<0.0005	<0.0005	17.8	<0.00005	<0.0001	<0.0005	0.0104	<0.03				
Starter Pit Rock	IV	TP041-02	0+40S	61	65	97	93	8.0	103	0	1	51	<3	40	<0.00001	0.140	0.0015	<0.01	0.0041	<0.0005	<0.0005	14.2	<0.00005	<0.0001	<0.0005	0.0049	<0.03				
Starter Pit Rock	IV	TP287-01	1+80N	48	52	97	93	8.0	73	0	3	38	<3	29	0.00002	0.124	0.0010	0.01	0.0018	<0.0005	<0.0005	10.6	<0.00005	<0.0001	<0.0005	0.0035	<0.03				
		min						6.7	11	0	0	5	<3	0.3	<0.00001	0.016	0.0006	<0.01	0.0003	<0.0005	<0.0005	<0.05	<0.00005	<0.0001	<0.0005	0.0006	<0.03				
		max						8.3	129	0	7	63	6	50	0.00002	0.237	0.0148	0.02	0.0041	<0.0005	<0.0005	17.8	0.00009	0.0018	0.0010	0.0104	<0.03				
		average						7.2	62	0	3	30	<3	23	<0.00001	0.100	0.0050	<0.01	0.0018	<0.0005	<0.0005	8.14	<0.00005	0.0003	<0.0005	0.0049	<0.03				
		median						7.9	68	0	3	37	<3	28	<0.00001	0.120	0.0028	<0.01	0.0018	<0.0005	<0.0005	9.92	<0.00005	<0.0001	<0.0005	0.0051	<0.03				
		standard deviation						0.7	42	0	3	22	2	18	n/a	0.074	0.0050	0.005	0.0012	n/a	n/a	6.68	n/a	0.0006	0.0003	0.0027	n/a				
Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:																															
		min						6.8	7	0	0	5	<3	1	<0.00001	0.017	0.0003	<0.01	0.0003	<0.0005	<0.0005	0.2	<0.00005	<0.0001	<0.0005	0.0004	<0.03				
		max						8.2	141	0	2	73	12	66	0.00003	0.279	0.1750	0.03	0.0225	<0.0005	<0.0005	21.8	0.00006	0.0011	<0.0005	0.0182	0.05				
		average						7.4	63	0	1	30	2	25	0.00001	0.102	0.0110	0.01	0.0031	<0.0005	<0.0005	8.1	<0.00005	0.0002	<0.0005	0.0062	0.02				
		median						7.8	50	0	1	27	<3	25	<0.00001	0.089	0.0007	<0.01	0.0022	<0.0005	<0.0005	6.4	<0.00005	<0.0001	<0.0005	0.0041	<0.03				
		standard deviation						0.5	39	0	0	21	2	19	0.000005	0.074	0.0345	0.006	0.0042	n/a	n/a	6.7	0.00001	0.0003	n/a	0.0057	0.01				

Table 3-4
Shake Flask Extraction Leachate Concentrations
Meadowbank Project
Cumberland Resources Ltd.

CCME (CEQG) (freshwater aquatic life)** (mg/L)								6.5 - 9.0								0.0001	0.005 - 0.1	0.005							0.000017		0.001 / 0.0089	0.002 - 0.004	0.3		
Metal Mine Effluent Regulation (MMER) ^{6**} (mg/L)								6.0 - 9.5										0.5										0.3			
Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		pH (s.u.)	Conductivity (uS/cm)	Acidity (pH4.5) (mg/L as CaCO ₃)	Acidity (pH8.3) (mg/L as CaCO ₃)	Alkalinity (mg/L as CaCO ₃)	Sulfate (mg/L)	Calculated Hardness (mg/L equiv. CaCO ₃)	Ag (mg/L)	Al ^I (mg/L)	As (mg/L)	B (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	Ca (mg/L)	Cd ³⁺ (mg/L)	Co (mg/L)	Cr ² (mg/L)	Cu ^a (mg/L)	Fe (mg/L)				
Starter Pit Rock	IF	TP371-01 [#]	(3P2) 1+40N	7	10	134	131	5.4	35	0	14	3	15	7	<0.00001	0.006	0.0154	0.033	0.0208	0.0018	<0.0005	1.71	0.00014	0.0011	<0.0005	0.0172	1.94				
Starter Pit Rock	IF	TP382-01	2+63N	8	11	131	128	7.3	33	0	6	14	3	0.5	<0.00001	0.019	0.0053	0.011	0.0004	<0.0005	<0.0005	0.11	<0.00005	<0.0001	<0.0005	0.0044	0.14				
Starter Pit Rock	IF	TP151-01	3P2 3+40N	29	32	125	122	7.2	28	0	6	11	5	11	0.00002	0.017	0.0001	0.011	0.0081	<0.0005	<0.0005	2.43	<0.00005	<0.0001	<0.0005	0.0135	0.03				
Starter Pit Rock	IF	TP194-01	(3P2) 1+00N	18	22	122	118	6.9	54	0	4	6	20	21	<0.00001	<0.001	0.0164	0.036	0.0227	<0.0005	<0.0005	4.45	<0.00005	0.0014	<0.0005	0.0086	<0.03				
Starter Pit Rock	IF	TP370-01	(3P2) 1+00N	20	24	122	118	7.5	82	0	7	22	20	27	0.00001	0.001	0.0004	0.036	0.0087	<0.0005	<0.0005	6.35	<0.00005	0.0001	0.0007	0.0073	<0.03				
Starter Pit Rock	IF	TP042-02	0+80S	30	34	120	116	7.8	71	0	2	25	6	32	0.00008	0.013	0.0094	0.013	0.0083	<0.0005	<0.0005	11.7	<0.00005	<0.0001	<0.0005	0.0120	0.13				
Starter Pit Rock	IF	TP371-02	(3P2) 1+40N	26	30	117	113	6.3	26	0	3	4	8	6	<0.00001	0.001	0.0011	0.016	0.0034	<0.0005	<0.0005	0.63	<0.00005	0.0021	<0.0005	0.0069	<0.03				
Starter Pit Rock	IF	TP023-01	3+25N	35	39	110	106	7.3	39	0	1	12	6	19	<0.00001	0.007	0.0004	0.020	0.0052	<0.0005	<0.0005	3.95	<0.00005	<0.0001	<0.0005	0.0184	<0.03				
Starter Pit Rock	IF	TP291-02	1+80N	55	60	105	102	7.9	67	0	1	37	<3	26	<0.00001	0.102	0.0002	0.020	0.0146	<0.0005	<0.0005	6.02	<0.00005	<0.0001	<0.0005	0.0002	<0.03				
Starter Pit Rock	IF	TP205-02	(3P2) 2+20N	92	95	80	77	7.8	67	0	2	34	<3	32	<0.00001	0.005	0.0006	0.015	0.0108	<0.0005	<0.0005	8.46	<0.00005	<0.0001	<0.0005	0.0072	<0.03				
min max average median standard deviation								5.4	26	0	1	3	<3	0.5	<0.00001	<0.001	0.0001	0.011	0.0004	<0.0005	<0.0005	0.11	<0.00005	<0.0001	<0.0005	0.0002	<0.0005	0.0002	<0.0005	0.0002	<0.03
								7.9	82	0	14	37	20	32	0.00008	0.102	0.0164	0.036	0.0227	0.0018	<0.0005	11.7	0.00014	0.0021	<0.0007	0.0184	1.94				
								6.3	50	0	5	17	9	18	0.00001	0.017	0.0049	0.021	0.0103	<0.0005	<0.0005	4.58	<0.00005	0.0005	<0.0005	0.0096	0.23				
								7.3	47	0	3	13	6	20	<0.00001	0.006	0.0008	0.018	0.0085	<0.0005	<0.0005	4.20	<0.00005	<0.0001	<0.0005	0.0079	<0.03				
								0.8	20	0	4	12	7	11	0.00002	0.031	0.0065	0.010	0.0072	n/a	n/a	3.65	n/a	0.0008	n/a	0.0057	0.60				

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

<i>min</i>	4.5	15	0	0	0	<3	8	<0.00001	0.002	<0.0001	<0.01	0.0013	<0.0005	<0.0005	1.35	<0.00005	<0.0001	<0.005	0.0002	<0.03
<i>max</i>	8.2	203	0	30	67	73	100	0.00005	0.102	0.0066	0.28	0.0750	0.0025	<0.0005	22.0	0.00031	0.0039	<0.005	0.0358	12.5
<i>average</i>	5.4	76	0	3	26	12	29	0.00001	0.027	0.0015	0.03	0.0102	<0.0025	<0.0005	7.41	<0.00030	0.0003	<0.005	0.0079	0.75
<i>median</i>	7.7	63	0	1	22	3	23	<0.00001	0.011	0.0008	0.02	0.0045	<0.0005	<0.0005	6.02	<0.00005	<0.0001	<0.005	0.0060	<0.03
<i>standard deviation</i>	0.9	57	0	7	18	20	22	0.00001	0.030	0.0017	0.06	0.0174	n/a	n/a	5.34	n/a	0.0009	n/a	0.0090	3.03

CCME (CEQG) (freshwater aquatic life)** (mg/L)								6.5 - 9.0								0.0001	0.005 - 0.1	0.005								0.000017		0.001 / 0.0089	0.002 - 0.004	0.3	
Metal Mine Effluent Regulation (MMER) ^{6***} (mg/L)								6.0 - 9.5											0.5										0.3		
Material	Lithology	Sample ID	Line	Depth interval (m)		Elevation (m)		pH (s.u.)	Conductivity (uS/cm)	Acidity (pH4.5) (mg/L as CaCO ₃)	Acidity (pH8.3) (mg/L as CaCO ₃)	Alkalinity (mg/L as CaCO ₃)	Sulfate (mg/L)	Calculated Hardness (mg/L equiv. CaCO ₃)	Ag (mg/L)	Al ^I (mg/L)	As (mg/L)	B (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	Ca (mg/L)	Cd ²⁺ (mg/L)	Co (mg/L)	Cr ² (mg/L)	Cu ¹ (mg/L)	Fe (mg/L)				
				from	to	from	to																								
Starter Pit Rock	UM	TP001-01	(3P2) 2+20N	16	20	131	127	8.0	77	0	4	43	<3	42	<0.00001	0.012	0.0227	<0.01	0.0035	<0.0005	<0.0005	12.4	<0.00005	<0.0001	<0.0005	0.0051	<0.03				
Starter Pit Rock	UM	TP008-01	(3P2) 3+00N	13	17	127	124	7.8	66	0	2	28	<3	28	<0.00001	0.011	0.0011	<0.01	0.0022	<0.0005	<0.0005	5.70	<0.00005	<0.0001	0.0007	0.0046	<0.03				
Starter Pit Rock	UM	TP041-01	0+40S	19	23	121	117	8.3	118	0	0	57	<3	47	<0.00001	0.029	0.0034	0.02	0.0099	<0.0005	<0.0005	13.1	<0.00005	<0.0001	0.0010	0.0040	<0.03				
Starter Pit Rock	UM	TP373-01	(3P2) 1+00N	26	30	117	113	7.9	52	0	3	31	<3	24	<0.00001	0.011	0.0009	<0.01	0.0005	<0.0005	<0.0005	5.11	<0.00005	0.0002	0.0008	0.0045	<0.03				
Starter Pit Rock	UM	TP377-01	(3P2) 1+40N	26	30	117	112	8.3	123	0	1	60	<3	48	<0.00001	0.019	0.0035	0.01	0.0164	<0.0005	<0.0005	14.4	<0.00005	<0.0001	0.0006	0.0034	<0.03				
Starter Pit Rock	UM	TP001-02	(3P2) 2+20N	37	41	115	111	7.9	51	0	4	31	<3	30	<0.00001	0.011	0.0025	<0.01	0.0029	<0.0005	<0.0005	6.03	<0.00005	<0.0001	<0.0005	0.0116	<0.03				
Starter Pit Rock	UM	TP261-01	1+80N	34	38	107	103	8.1	101	0	2	47	<3	51	<0.00001	0.007	0.0009	<0.01	0.0048	<0.0005	<0.0005	13.1	<0.00005	<0.0001	<0.0005	0.0058	<0.03				
Starter Pit Rock	UM	TP376-01	(3P2) 1+40N	56	60	102	98	7.9	69	0	3	38	<3	29	<0.00001	0.010	0.0004	<0.01	0.0025	<0.0005	<0.0005	5.96	<0.00005	<0.0001	<0.0005	0.0050	<0.03				
min max average median standard deviation								7.8	51	0	0	28	<3	24	<0.00001	0.007	0.0004	<0.01	0.0005	<0.0005	<0.0005	5.1	<0.00005	<0.0001	<0.0005	5.1	<0.00005	<0.0001	<0.0005	0.0034	<0.03
								8.3	123	0	4	60	<3	51	<0.00001	0.029	0.0227	0.02	0.0164	<0.0005	<0.0005	14.4	<0.00005	0.0002	0.0010	0.0116	<0.03				
								8.0	82	0	2	42	<3	37	<0.00001	0.014	0.0044	<0.01	0.0053	<0.0005	<0.0005	9.5	<0.00005	<0.0001	0.0005	0.0055	<0.03				
								8.0	73	0	2	40	<3	36	<0.00001	0.011	0.0018	<0.01	0.0032	<0.0005	<0.0005	9.2	<0.00005	<0.0001	<0.0005	0.0048	<0.03				
								0.2	28	0	1	12	n/a	11	n/a	0.007	0.0075	0.006	0.0053	n/a	n/a	4.1	n/a	n/a	0.0003	0.0026	n/a				

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

<i>min</i>	7.8	61	0	0	34	<3	24	<0.00001	0.003	<0.0001	<0.01	0.0014	<0.0005	<0.0005	6.55	<0.00005	<0.0001	<0.0005	0.0002	<0.03
<i>max</i>	8.3	159	0	1	76	29	78	0.00003	0.090	0.0747	0.09	0.0518	<0.0005	<0.0005	19.3	<0.00005	0.0008	0.0021	0.0132	<0.03
<i>average</i>	8.1	109	0	1	54	3	51	<0.00003	0.017	0.0065	0.03	0.0161	<0.0005	<0.0005	12.4	<0.00005	0.0001	0.0006	0.0045	<0.03
<i>median</i>	8.1	113	0	1	54	<3	50	<0.00001	0.011	0.0004	0.02	0.0115	<0.0005	<0.0005	11.4	<0.00005	<0.0001	<0.0005	0.0021	<0.03
<i>standard deviation</i>	0.1	31	0	0	13	6	15	n/a	0.024	0.0177	0.03	0.0152	n/a	n/a	4.7	n/a	0.0002	0.0005	0.0049	n/a

Method Detection Limit		pH (s.u.)	Conductivity (uS/cm)	Acidity - pH 4.5 (mg/L as CaCO3)	Acidity - pH 8.3 (mg/L as CaCO3)	Alkalinity (mg/L as CaCO3)	Sulphate (mg/L)	Hardness (mg/L as CaCO3)	Ag (mg/L)	Al ^I (mg/L)	As (mg/L)	B (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	Ca (mg/L)	Cd ³⁺ (mg/L)	Co (mg/L)	Cr ² (mg/L)	Cu ¹ (mg/L)	Fe (mg/L)
CEMI		0.01	5	1	1	1	3.0	-	0.000010	0.001	0.0001	0.010	0.00005	0.00050	0.0005	0.02	0.00005	0.00010	0.00050	0.0001	0.03

NOTES:

[#] samples located above 130 m elevation (estimated maximum bench elevation to be mined within the first year or pre-production).

- Freshwater Aquatic Life Guideline is pH, calcium and DOC

Table 3-4
Shake Flask Extraction Leachate Concentrations
Meadowbank Project
Cumberland Resources Ltd.

CCME (CEQG) (freshwater aquatic life)** (mg/L)						0.0001					0.073		0.025 - 0.15		0.001 - 0.007		0.001						0.0008			0.03		0.12					
Metal Mine Effluent Regulation (MMER) ^{6****} (mg/L)													0.5		0.2											0.5							
Dissolved Metals (mg/L)																												Dissolved Anions (mg/L)				Nutrients (mg/L)	
Material	Lithology	Sample ID	Line	Depth interval (m)		Hg (mg/L)	K (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Mo (mg/L)	Na (mg/L)	Ni ³ (mg/L)	P (mg/L)	Pb ³ (mg/L)	Sb (mg/L)	Se (mg/L)	Si (mg/L)	Sn (mg/L)	Sr (mg/L)	Ti (mg/L)	Ti (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Cl (mg/L)	F ¹ (mg/L)	N ⁵ (mg/L)	P (mg/L)				
Airstrip - Overburden	Till	59545	-	0	1.1	<0.00005	<2	<0.005	2.2	0.0221	0.00352	5	0.0012	<0.3	0.00028	<0.0001	<0.001	1.56	<0.0001	0.0889	0.01	<0.0001	0.00386	<0.001	0.001	2.0	0.72	<0.5	0.036				
Airstrip - Overburden	Till	59544	-	0	1.4	<0.00005	2	<0.005	2.2	0.0192	0.00811	5	0.0013	<0.3	0.00029	<0.0001	<0.001	2.77	<0.0001	0.0748	0.02	<0.0001	0.00598	<0.001	0.002	1.6	0.98	<0.5	0.028				
Airstrip - Overburden	Till	2015	-	1.2	2.7	<0.00005	2	<0.005	1.9	0.0674	0.00301	7	<0.0005	<0.3	0.00011	0.0001	<0.001	1.58	<0.0001	0.1160	0.01	<0.0001	0.00445	<0.001	<0.001	2.9	0.52	<0.5	0.012				
min						<0.00005	<2	<0.005	1.9	0.0192	0.00301	5	<0.0005	<0.3	0.00011	<0.0001	<0.001	1.56	<0.0001	0.0748	0.01	<0.0001	0.00386	<0.001	<0.001	1.6	0.52	<0.5	0.012				
max						<0.00005	2	<0.005	2.2	0.0674	0.00811	7	0.0013	<0.3	0.00029	0.0001	<0.001	2.77	<0.0001	0.1160	0.02	<0.0001	0.00598	<0.001	0.002	2.9	0.98	<0.5	0.036				
average						<0.00005	2	<0.005	2.1	0.0362	0.00488	6	0.0009	<0.3	0.00023	0.00007	<0.001	1.97	<0.0001	0.0932	0.01	<0.0001	0.00476	<0.001	0.001	2.2	0.74	<0.5	0.025				
median						<0.00005	2	<0.005	2.2	0.0221	0.00352	5	0.0012	<0.3	0.00028	0.00005	<0.001	1.58	<0.0001	0.0889	0.01	<0.0001	0.00445	<0.001	0.001	2.0	0.72	<0.5	0.028				
standard deviation						n/a	1	n/a	0.2	0.0270	0.00281	1	0.0006	n/a	0.00010	0.00003	n/a	0.69	n/a	0.0209	0.01	n/a	0.00109	n/a	0.001	0.7	0.23	n/a	0.012				
Material	Lithology	Sample ID	Line	Depth interval (m)		Hg (mg/L)	K (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Mo (mg/L)	Na (mg/L)	Ni ⁴ (mg/L)	P (mg/L)	Pb ⁴ (mg/L)	Sb (mg/L)	Se (mg/L)	Si (mg/L)	Sn (mg/L)	Sr (mg/L)	Ti (mg/L)	Ti (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Cl (mg/L)	F ⁴ (mg/L)	N ⁵ (mg/L)	P (mg/L)				
Airstrip - Rock	IV	AIR - 001	-	Surface		0.00027	2	<0.005	2.3	0.0408	0.00069	3	0.0008	<0.3	<0.00005	<0.0001	<0.001	1.49	<0.0001	0.11	<0.01	<0.0001	0.00031	<0.001	0.001	-	-	-	-				
Airstrip - Rock	IV	AIR - 005	-	Surface		<0.00005	4	<0.005	1.4	0.0176	0.00012	3	<0.0005	<0.3	<0.00005	0.0003	<0.001	1.44	<0.0001	0.09	<0.01	<0.0001	0.00003	<0.001	<0.001	-	-	-	-				
Airstrip - Rock	IV	AIR - 008	-	Surface		0.00011	6	<0.005	2.2	0.0597	0.00044	2	0.0018	<0.3	<0.00005	0.0001	<0.001	1.43	<0.0001	0.09	<0.01	<0.0001	0.00056	<0.001	<0.001	-	-	-	-				
Airstrip - Rock	IV	AIR - 010	-	Surface		<0.00005	4	<0.005	1.6	0.0303	0.00014	<2	<0.0005	<0.3	<0.00005	0.0001	<0.001	1.54	<0.0001	0.08	<0.01	<0.0001	0.00018	<0.001	<0.001	-	-	-	-				
min						<0.00005	2	<0.005	1.4	0.0176	0.00012	<2	<0.0005	<0.3	<0.00005	<0.0001	<0.001	1.43	<0.0001	0.08	<0.01	<0.0001	0.00003	<0.001	<0.001	-	-	-	-				
max						0.00027	6	<0.005	2.3	0.0597	0.00069	3	0.0018	<0.3	<0.00005	0.0003	<0.001	1.54	<0.0001	0.11	<0.01	<0.0001	0.00056	<0.001	0.001	-	-	-	-				
average						0.00011	4	<0.005	1.9	0.0371	0.00035	2	0.0008	<0.3	<0.00005	0.0001	<0.001	1.48	<0.0001	0.09	<0.01	<0.0001	0.00027	<0.001	<0.001	-	-	-	-				
median						0.00007	4	<0.005	1.9	0.0356	0.00029	3	0.0005	<0.3	<0.00005	0.0001	<0.001	1.47	<0.0001	0.09	<0.01	<0.0001	0.00025	<0.001	<0.001	-	-	-	-				
standard deviation						0.00012	2	n/a	0.4	0.0178	0.00027	1	0.0007	n/a	n/a	0.0001	n/a	0.05	n/a	0.01	n/a	n/a	0.00022	n/a	n/a	-	-	-	-				
CCME (CEQG) (freshwater aquatic life)** (mg/L)						0.0001					0.073		0.025 - 0.15		0.001 - 0.007		0.001								0.0008			0.03					
Metal Mine Effluent Regulation (MMER) ^{6****} (mg/L)													0.5		0.2												0.5						
Material	Lithology	Sample ID	Line	Depth interval (m)		Hg (mg/L)	K (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Mo (mg/L)	Na (mg/L)	Ni ³ (mg/L)	P (mg/L)	Pb ³ (mg/L)	Sb (mg/L)	Se (mg/L)	Si (mg/L)	Sn (mg/L)	Sr (mg/L)	Ti (mg/L)	Ti (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Cl (mg/L)	F ⁴ (mg/L)	N ⁵ (mg/L)	P (mg/L)				
Starter Pit Rock	IV	TP316-01	3+00N	17	21	<0.00005	3.8	<0.005	1.2	0.01500	0.06380	<2	0.0158	<0.3	0.00022	0.0054	0.0008	0.83	<0.0001	0.0109	<0.01	0.0001	0.00004	<0.001	0.003	-	-	-	-				
Starter Pit Rock	IV	TP030-01	3+00N	8	12	<0.00005	5.0	<0.005	0.2	0.00673	0.00072	<2	0.0083	<0.3	<0.00005	0.0005	<0.0005	0.87	<0.0001	0.0035	<0.01	<0.0001	0.00004	<0.001	0.002	-	-	-	-				
Starter Pit Rock	IV	TP464-01	0+9S	15	20	<0.00005	3.6	<0.005	0.2	0.00242	0.00073	<2	0.0033	<0.3	0.00013	0.0005	<0.0005	0.62	<0.0001	0.0035	<0.01	<0.0001	0.00005	<0.001	0.001	-	-	-	-				
Starter Pit Rock	IV	TP317-01	3+25N	25	29	-	7.0	<0.005	1.0	0.00461	0.00100	<2	<0.0005	<0.3	<0.00005	0.0002	<0.001	1.27	<0.0001	0.0317	<0.01	<0.0001	0.00014	<0.001	<0.001	-	-	-	-				
Starter Pit Rock	IV	TP151-02	3P2 3+40N	38	42	<0.00005	9.2	<0.005	0.9	0.01120	0.00036	<2	0.0007	<0.3	0.00005	0.0002	0.0005	1.06	<0.0001	0.0301	<0.01	<0.0001	0.00007	<0.001	0.001	-	-	-	-				
Starter Pit Rock	IV	TP004-01	(3P2) 3+00N	30	34	<0.00005	3.7	<0.005	<0.1	0.00079	0.00066	<2	0.0012	<0.3	0.00011	0.0017	<0.0005	0.80	<0.0001	0.0005	<0.01	<0.0001	0.00009	<0.001	0.002	-	-	-	-				
Starter Pit Rock	IV	TP469-02	(3P2) 2+60N	48	52	<0.00005	6.3	<0.005	0.8	0.00295	0.00023	<2	<0.0005	<0.3	0.00006	0.0003	0.0006	0.82	<0.0001	0.0176	<0.01	<0.0001	0.00003	<0.001	<0.001	-	-	-	-				
Starter Pit Rock	IV	TP282-04	3+25N	37	40	-	9.0	<0.005	1.3	0.01310	0.00037	<2	<0.0005	<0.3	0.00018	0.0007	<0.001	1.36	<0.0001	0.0506	<0.01	<0.0001	0.00008	<0.001	<0.001	-	-	-	-				
Starter Pit Rock	IV	TP041-02	0+40S	61	65	<0.00005	8.7	<0.005	1.0	0.03060	0.00066	<2	<0.0005	<0.3	0.00239	0.0002	<0.0005	1.12	<0.0001	0.0312	<0.01	<0.0001	0.00133	<0.001	0.001	-	-	-	-				
Starter Pit Rock	IV	TP287-01	1+80N	48	52	<0.00005	7.6	<0.005	0.7	0.00969	0.00065	<2	<0.0005	<0.3	0.00008	0.0007	0.0005	0.94	<0.0001	0.0183	<0.01	<0.0001	0.00009	<0.001	0.003	-	-	-	-				
min						<0.00005	3.6	<0.005	<0.1	0.00079	0.00023	<2	<0.0005	<0.3	<0.00005	0.0002	<0.0005	0.82	<0.0001	0.0005	<0.01	<0.0001	0.00003	<0.001	<0.001	-	-	-	-				
max						<0.00005	9.2	<0.005	1.3	0.03060	0.06380	<2	0.0158	<0.3	0.00239	0.0054	0.0008	1.36	<0.0001	0.0506	<0.01	0.0001	0.00133	<0.001	0.003	-	-	-	-				
average						<0.00005	6.4	<0.005	0.7	0.00971	0.00692	<2	0.0029	<0.3	0.00033	0.0011	<0.0005	0.97	<0.0001	0.0198	<0.01	<0.0001	0.00020	<0.001	0.001	-	-	-	-				
median						<0.00005	6.7	<0.005	0.8	0.00821	0.00066	<2	<0.0005	<0.3	0.00010	0.0005	<0.001	0.91	<0.0001	0.0180	<0.01	<0.0001	0.00007	<0.001	0.001	-	-	-	-				
standard deviation						n/a	2.2	n/a	0.5	0.00876	0.01999	n/a	0.0050	n/a	0.00073	0.0016	0.0002	0.23	n/a	0.0160	n/a	n/a	0.00040	n/a	0.0009	-	-	-	-				
Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:																																	
min	-					<2	<0.005	0.1	0.0018	0.00012	<2	<0.0005	<0.3	<0.00005	<0.0001	<0.001	0.55	<0.0001	0.002	<0.01	<0.0001	<0.00001	<0.001	<0.001	-	-	-	-	-				
max	-					9	<0.005	3.5	0.0552	0.01970	3	0.0215	<0.3	0.00034	0.0027	<0.001	1.74	<0.0001	0.087	<0.01	0.0002	0.0011	0.001	0.005	-	-	-	-	-				
average	-					5	<0.005	1.3	0.0136	0.00193	1	0.0024	<0.3	0.00011	0.0005	<0.001	1.03	<0.0001	0.029	<0.01	0.0001	0.00018	<0.001	0.001	-	-	-	-	-				
median	-					6	<0.005	1.0	0.0067	0.00077	<2	<0.0005	<0.3	0.00009	0.0004	<0.001	0.97	<0.0001	0.029	<0.01	<0.0001	0.00013	<0.001	<0.001	-	-	-	-	-				
standard deviation	-																																

Table 3-4
Shake Flask Extraction Leachate Concentrations
Meadowbank Project
Cumberland Resources Ltd.

CCME (CEQG) (freshwater aquatic life)** (mg/L)						0.0001					0.073			0.025 - 0.15		0.001 - 0.007		0.001							0.0008			0.03						
Metal Mine Effluent Regulation (MMER)*** (mg/L)														0.5		0.2													0.5					
Material	Lithology	Sample ID	Line	Depth interval (m)		Hg (mg/L)	K (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Mo (mg/L)	Na (mg/L)	Ni ³ (mg/L)	P (mg/L)	Pb ³ (mg/L)	Sb (mg/L)	Se (mg/L)	Si (mg/L)	Sn (mg/L)	Sr (mg/L)	Ti (mg/L)	Tl (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Cl (mg/L)	F ¹ (mg/L)	N ⁵ (mg/L)	P (mg/L)					
Starter Pit Rock	IF	TP371-01 [†]	(3P2) 1+40N	7	10	<0.00005	3	<0.005	0.7	0.087	<0.00005	<2	0.0350	<0.3	0.00058	<0.0001	<0.0005	0.33	<0.0001	0.010	<0.01	<0.0001	0.00002	<0.001	0.0587	-	-	-	-	-	-			
Starter Pit Rock	IF	TP382-01	2+63N	8	11	0.00011	6	<0.005	<0.1	0.001	0.00986	6	<0.0005	<0.3	0.00023	0.0002	0.0005	1.04	<0.0001	0.001	<0.01	<0.0001	0.00005	<0.001	0.0012	-	-	-	-	-	-			
Starter Pit Rock	IF	TP151-01	3P2 3+40N	29	32	<0.00005	4	<0.005	1.2	0.047	0.00018	<2	0.0007	<0.3	0.00016	0.0005	<0.0005	0.41	<0.0001	0.012	<0.01	<0.0001	0.00003	<0.001	0.0015	-	-	-	-	-	-			
Starter Pit Rock	IF	TP194-01	(3P2) 1+00N	18	22	<0.00005	2	<0.005	2.4	0.183	0.00013	<2	0.0099	<0.3	<0.00005	0.0002	0.0006	0.60	<0.0001	0.019	<0.01	<0.0001	<0.00001	<0.001	0.0034	-	-	-	-	-	-			
Starter Pit Rock	IF	TP370-01	(3P2) 1+00N	20	24	<0.00005	6	<0.005	2.6	0.083	0.00036	2	0.0042	<0.3	0.00010	0.0003	0.0008	0.77	<0.0001	0.030	<0.01	<0.0001	0.00001	<0.001	0.0012	-	-	-	-	-	-			
Starter Pit Rock	IF	TP042-02	0+80S	30	34	<0.00005	<2	<0.005	0.7	0.061	0.00125	<2	0.0052	<0.3	0.00025	0.0003	<0.0005	0.84	<0.0001	0.050	<0.01	<0.0001	0.00003	<0.001	0.0014	-	-	-	-	-	-			
Starter Pit Rock	IF	TP371-02	(3P2) 1+40N	26	30	<0.00005	3	<0.005	1.2	0.022	<0.00005	<2	0.0928	<0.3	0.00007	0.0004	<0.0005	0.44	<0.0001	0.004	<0.01	<0.0001	<0.00001	<0.001	0.0096	-	-	-	-	-	-			
Starter Pit Rock	IF	TP023-01	3+25N	35	39	-	<2	<0.005	2.3	0.113	<0.00005	<2	0.0022	<0.3	0.00006	0.0011	<0.001	0.80	<0.0001	0.026	<0.01	<0.0001	0.00002	<0.001	0.0030	-	-	-	-	-	-			
Starter Pit Rock	IF	TP291-02	1+80N	55	60	-	8	<0.005	2.7	0.009	0.00034	<2	<0.0005	<0.3	<0.00005	0.0011	<0.001	0.89	<0.0001	0.031	<0.01	<0.0001	<0.00001	<0.001	0.0030	-	-	-	-	-	-			
Starter Pit Rock	IF	TP205-02	(3P2) 2+20N	92	95	<0.00005	<2	<0.005	2.6	0.034	0.00039	2	<0.0005	<0.3	0.00008	0.0002	<0.0005	0.86	<0.0001	0.033	<0.01	<0.0001	0.00013	<0.001	0.0019	-	-	-	-	-	-			
min max average median standard deviation						<0.00005	<2	<0.005	<0.1	0.001	<0.00005	<2	<0.0005	<0.3	<0.00005	<0.0001	<0.0005	0.33	<0.0001	0.001	<0.01	<0.0001	<0.00001	<0.001	<0.00001	<0.00001	<0.001	0.0012	-	-	-	-	-	
						0.00011	8	<0.005	2.7	0.183	0.00986	6	0.0928	<0.3	0.00058	0.0011	0.0008	1.04	<0.0001	0.050	<0.01	<0.0001	0.00013	<0.001	0.0587	-	-	-	-	-	-	-	-	-
						<0.00005	3	<0.005	1.7	0.064	0.00126	<2	0.0151	<0.3	0.00016	0.0004	<0.0005	0.70	<0.0001	0.021	<0.01	<0.0001	0.00003	<0.001	0.0085	-	-	-	-	-	-	-	-	-
						<0.00005	3	<0.005	1.8	0.054	0.00026	<2	0.0032	<0.3	0.00009	0.0003	<0.0005	0.78	<0.0001	0.022	<0.01	<0.0001	0.00002	<0.001	0.0025	-	-	-	-	-	-	-	-	-
						n/a	2	n/a	1.0	0.055	0.00304	2	0.0293	n/a	0.00017	0.0004	0.0002	0.24	n/a	0.015	n/a	n/a	0.00004	n/a	0.0178	-	-	-	-	-	-	-	-	-

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

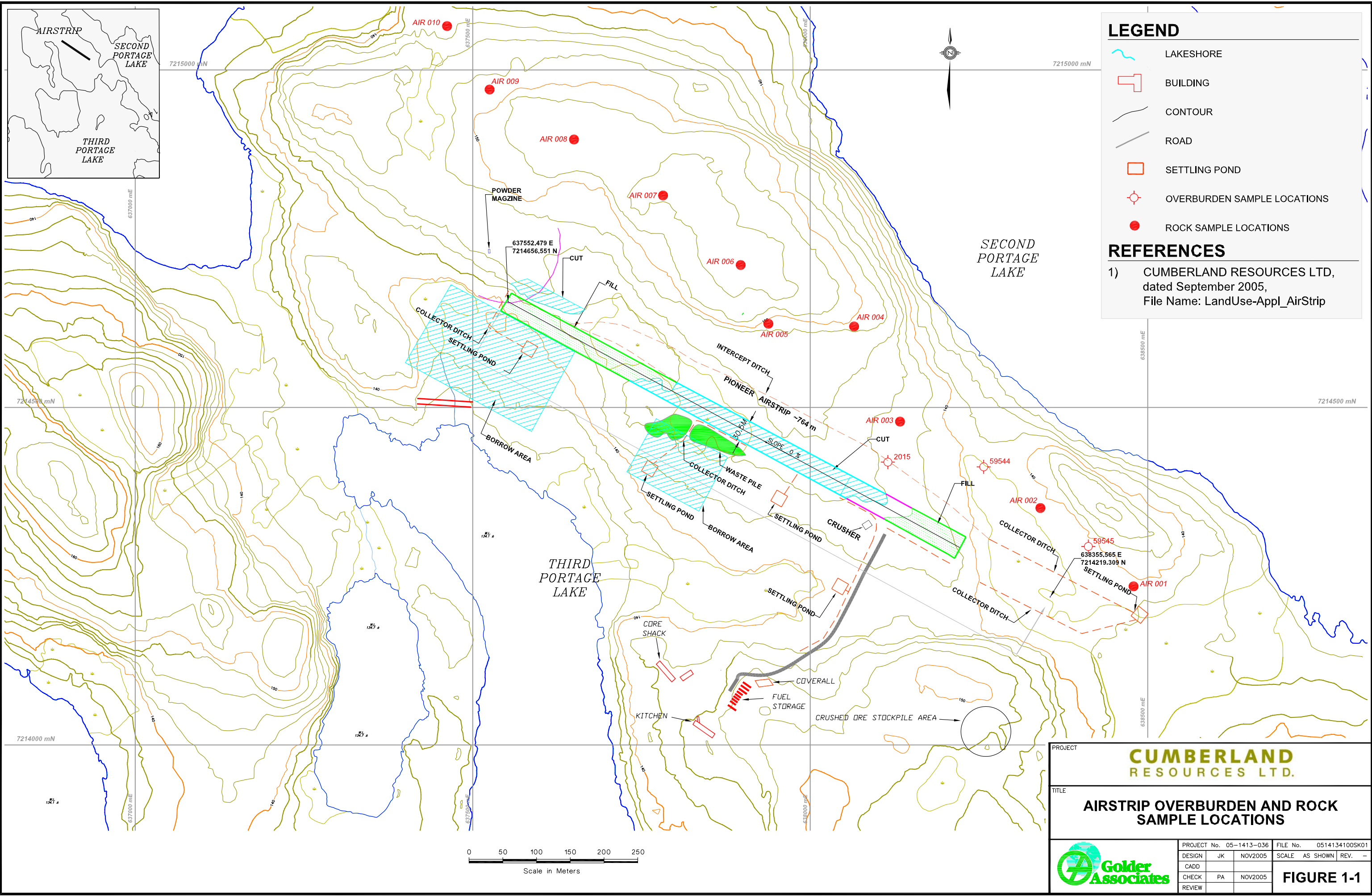
<i>min</i>	-	<2	<0.005	0.8	0.008	<0.00005	<2	<0.0005	<0.3	<0.00005	<0.0001	<0.001	0.5	<0.0001	0.010	<0.01	<0.0001	<0.00001	<0.001	<0.001	-	-	-	-	-	-	-	-	-
<i>max</i>	-	8	<0.005	10.9	0.275	0.0028	16	0.0335	<0.3	0.00455	0.0029	<0.001	2.9	<0.0001	0.216	<0.01	0.0001	0.0018	<0.001	0.155	-	-	-	-	-	-	-	-	-
<i>average</i>	-	3	<0.005	2.6	0.049	0.0006	3	0.0026	<0.3	0.00042	0.0007	<0.001	1.4	<0.0001	0.052	<0.01	<0.0001	0.00027	<0.001	0.010	-	-	-	-	-	-	-	-	-
<i>median</i>	-	2	<0.005	1.8	0.022	0.0003	<2	<0.0005	<0.3	<0.00005	0.0004	<0.001	1.1	<0.0001	0.031	<0.01	<0.0001	0.00008	<0.001	<0.001	-	-	-	-	-	-	-	-	-
<i>standard deviation</i>	-	2	n/a	2.5	0.068	0.0008	4	0.0080	n/a	0.00114	0.0007	n/a	0.7	n/a	0.054	n/a	n/a	0.00047	n/a	0.037	-	-	-	-	-	-	-	-	-

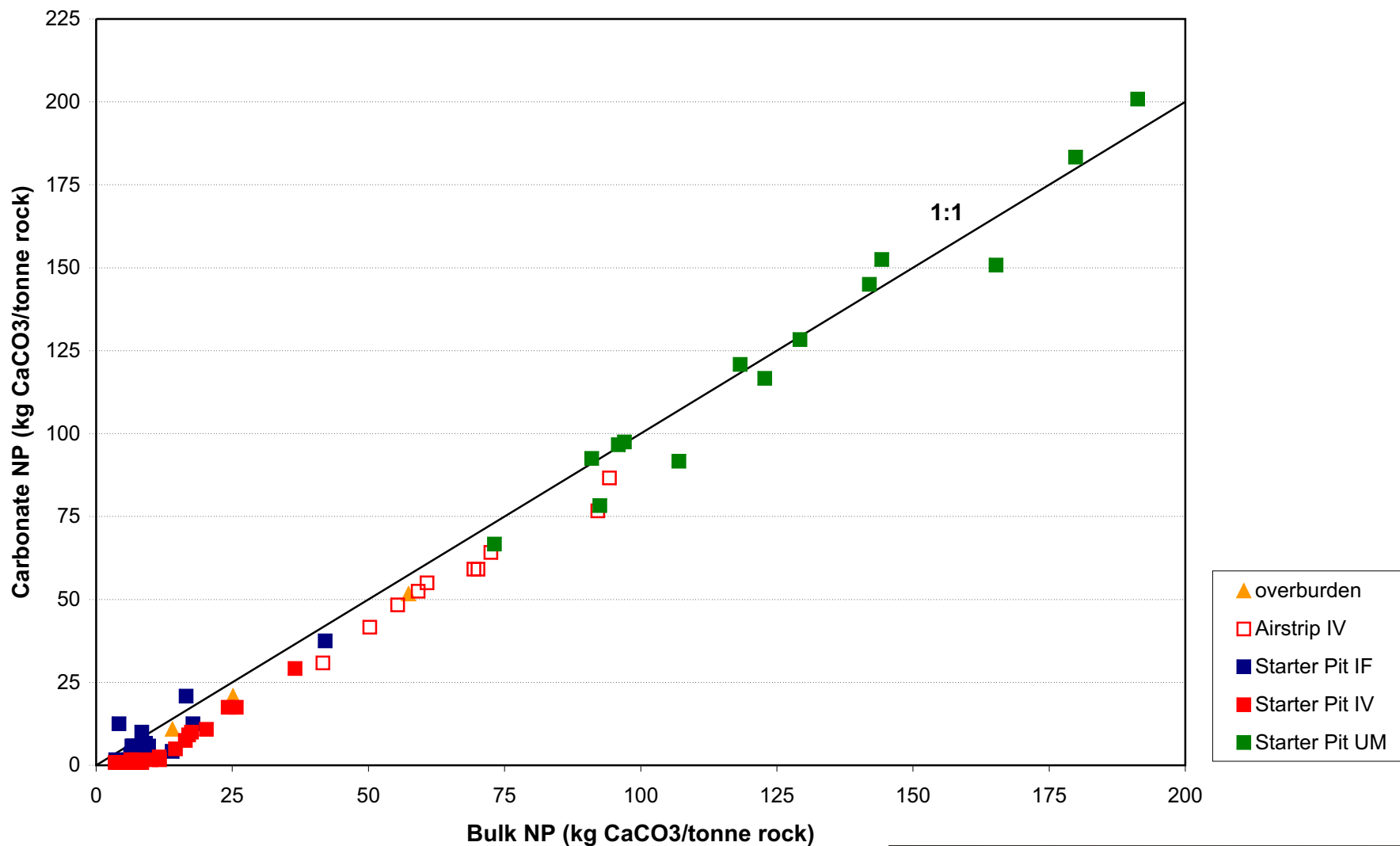
CCME (CEQG) (freshwater aquatic life)** (mg/L)						0.0001					0.073		0.025 - 0.15		0.001 - 0.007		0.001					0.0008			0.03					
Metal Mine Effluent Regulation (MMER) ^{***} (mg/L)													0.5		0.2										0.5					
Material	Lithology	Sample ID	Line	Depth interval (m) from to		Hg (mg/L)	K (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Mo (mg/L)	Na (mg/L)	Ni ¹ (mg/L)	P (mg/L)	Pb ¹ (mg/L)	Sb (mg/L)	Se (mg/L)	Si (mg/L)	Sn (mg/L)	Sr (mg/L)	Ti (mg/L)	Tl (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Cl (mg/L)	F ¹ (mg/L)	N ⁵ (mg/L)	P (mg/L)	
Starter Pit Rock	UM	TP001-01	(3P2) 2+20N	16	20	<0.00005	<2	<0.005	2.79	0.0077	0.00042	<2	0.0022	<0.3	0.00014	0.00167	0.0005	1.58	<0.0001	0.0260	<0.01	<0.0001	<0.00001	0.004	0.001	-	-	-	-	-
Starter Pit Rock	UM	TP008-01	(3P2) 3+00N	13	17	<0.00005	<2	<0.005	3.38	0.0130	0.00008	<2	0.0025	<0.3	0.00008	0.00294	<0.0005	1.37	<0.0001	0.0216	<0.01	<0.0001	<0.00001	0.001	0.001	-	-	-	-	-
Starter Pit Rock	UM	TP041-01	0+40S	19	23	<0.00005	10	<0.005	3.54	0.0056	0.00025	<2	0.0009	<0.3	0.00008	0.00038	<0.0005	1.30	<0.0001	0.0357	<0.01	<0.0001	<0.00001	0.001	0.007	-	-	-	-	-
Starter Pit Rock	UM	TP373-01	(3P2) 1+00N	26	30	<0.00005	<2	<0.005	2.63	0.0080	0.00008	3	0.0022	<0.3	0.00006	0.00030	0.0005	1.01	<0.0001	0.0172	<0.01	<0.0001	<0.00001	<0.001	<0.001	-	-	-	-	-
Starter Pit Rock	UM	TP377-01	(3P2) 1+40N	26	30	<0.00005	10	<0.005	2.91	0.0042	0.00012	<2	0.0029	<0.3	<0.00005	0.00054	<0.0005	1.63	<0.0001	0.0414	<0.01	<0.0001	<0.00001	0.002	<0.001	-	-	-	-	-
Starter Pit Rock	UM	TP001-02	(3P2) 2+20N	37	41	<0.00005	<2	<0.005	3.65	0.0125	0.00014	<2	0.0024	<0.3	0.00272	0.00085	<0.0005	1.57	<0.0001	0.0246	<0.01	<0.0001	<0.00001	<0.001	0.002	-	-	-	-	-
Starter Pit Rock	UM	TP261-01	1+80N	34	38	<0.00005	2	<0.005	4.49	0.0190	0.00133	<2	0.0022	<0.3	0.00006	0.00010	0.0005	1.56	<0.0001	0.0521	<0.01	<0.0001	0.00030	0.001	0.001	-	-	-	-	-
Starter Pit Rock	UM	TP376-01	(3P2) 1+40N	56	60	<0.00005	3	<0.005	3.32	0.0105	<0.00005	4	0.0008	<0.3	0.00006	0.00056	<0.0005	1.28	<0.0001	0.0294	<0.01	<0.0001	<0.00001	<0.001	0.001	-	-	-	-	-
min max average median standard deviation						<0.00005	<2	<0.005	2.63	0.0042	<0.00005	<2	0.0008	<0.3	<0.00005	0.00010	<0.0005	1.01	<0.0001	0.0172	<0.01	<0.0001	<0.00001	<0.001	<0.001	-	-	-	-	-
						<0.00005	10	<0.005	4.49	0.0190	0.00133	4	0.0029	<0.3	0.00272	0.00294	0.0005	1.63	<0.0001	0.0521	<0.01	<0.0001	0.00030	0.004	0.007	-	-	-	-	-
						<0.00005	4	<0.005	3.34	0.0101	0.00030	<2	0.0020	<0.3	0.00040	0.00092	<0.0005	1.41	<0.0001	0.0310	<0.01	<0.0001	0.00004	0.001	0.002	-	-	-	-	-
						<0.00005	<2	<0.005	3.35	0.0093	0.00013	<2	0.0022	<0.3	0.00007	0.00055	<0.0005	1.47	<0.0001	0.0277	<0.01	<0.0001	<0.00001	0.001	0.001	-	-	-	-	-
						n/a	4	n/a	0.59	0.0048	0.00043	1	0.0008	n/a	0.00094	0.00095	0.0001	0.21	n/a	0.0115	n/a	n/a	n/a	0.001	0.002	-	-	-	-	-

Statistics corresponding to pit waste rock samples in Goose Island and Portage pits (North and Third), outside of proposed Third Portage starter pit:

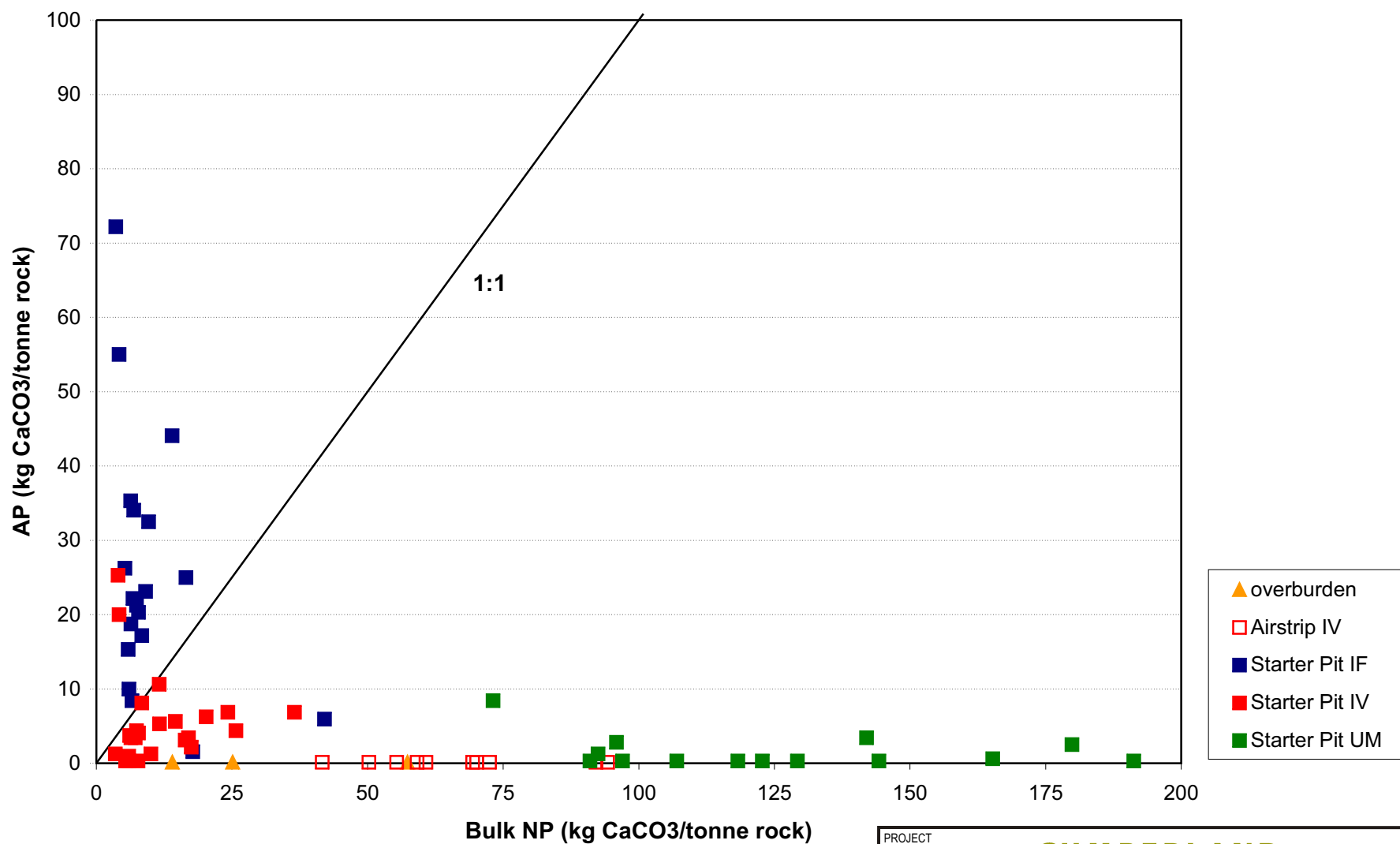
min	-	<2	<0.005	1.5	0.0059	<0.00005	<2	<0.0005	<0.3	<0.00005	<0.0001	<0.001	0.91	<0.0001	0.0283	<0.01	<0.0001	<0.00001	<0.001	<0.001	-	-	-	-	-	-	-	-	-
max	-	22	0.007	8.6	0.0382	0.00066	7	0.0070	<0.3	0.00017	0.0098	<0.001	3.83	0.0002	0.1200	<0.01	0.0001	0.00081	0.003	0.009	-	-	-	-	-	-	-	-	-
average	-	3	<0.007	4.8	0.0162	0.00015	2	0.0014	<0.3	0.00005	0.0013	<0.001	2.57	<0.0001	0.0709	<0.01	<0.0001	0.00010	0.001	0.001	-	-	-	-	-	-	-	-	-
median	-	<2	<0.005	4.6	0.0138	0.00011	<2	0.0007	<0.3	<0.00005	0.0004	<0.001	2.59	<0.0001	0.0782	<0.01	<0.0001	<0.00001	<0.001	<0.001	-	-	-	-	-	-	-	-	-
standard deviation	-	5	n/a	1.5	0.0081	0.00015	1	0.0018	n/a	0.00004	0.0023	n/a	0.90	0.00003	0.0328	n/a	0.00002	0.00021	0.001	0.002	-	-	-	-	-	-	-	-	-

REVISION DATE: 05/11/03 02:18PM By: Eabell
CADD FILE: N:\Bur-Graphics\Projects\2005\1413\05-1413-036\4100\Drafting\Cad\0514134100SK01.dwg





PROJECT		CUMBERLAND RESOURCES LTD.			
TITLE		BULK VERSUS CARBONATE NEUTRALIZATION POTENTIAL			
		PROJECT No. 05-1413-036		FILE No. 051413036SK01	
		DESIGN	PA	28NOV05	SCALE NTS
		CADD	GG	28NOV05	REV.
		CHECK	PA	28NOV05	FIGURE 3-1
		REVIEW			



PROJECT					CUMBERLAND RESOURCES LTD.				
TITLE					BULK NEUTRALIZATION POTENTIAL VERSUS ACID POTENTIAL				
					PROJECT No. 05-1413-036		FILE No. 051413036SK01		
					DESIGN	PA	28NOV05	SCALE	NTS
					CADD	GG	28NOV05	REV.	
					CHECK	PA	28NOV05	FIGURE 3-2	
					REVIEW				